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The Magazine for Information Executives



THE CIO
20
VISION AWARDS

20 WHO MADE IT POSSIBLE.
20 WHO MADE IT HAPPEN.

Your Guide to 40 Leaders Driving the Information Age PAGE 56

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VOL. 16 • NO. 1 • OCTOBER 1, 2002

THE CIO 20/20 VISION AWARDS

Special Issue

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MORE ▶▶▶



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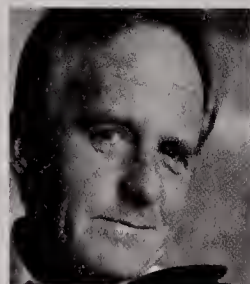
CXOs must immerse themselves in the IT planning process to ensure that technology investments pay off.

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Terri Morgan (left), CIO of the Department of Energy's Chicago operations, took courses from **Richard Friend** at the CIO Institute—and she has new negotiation skills to prove it.

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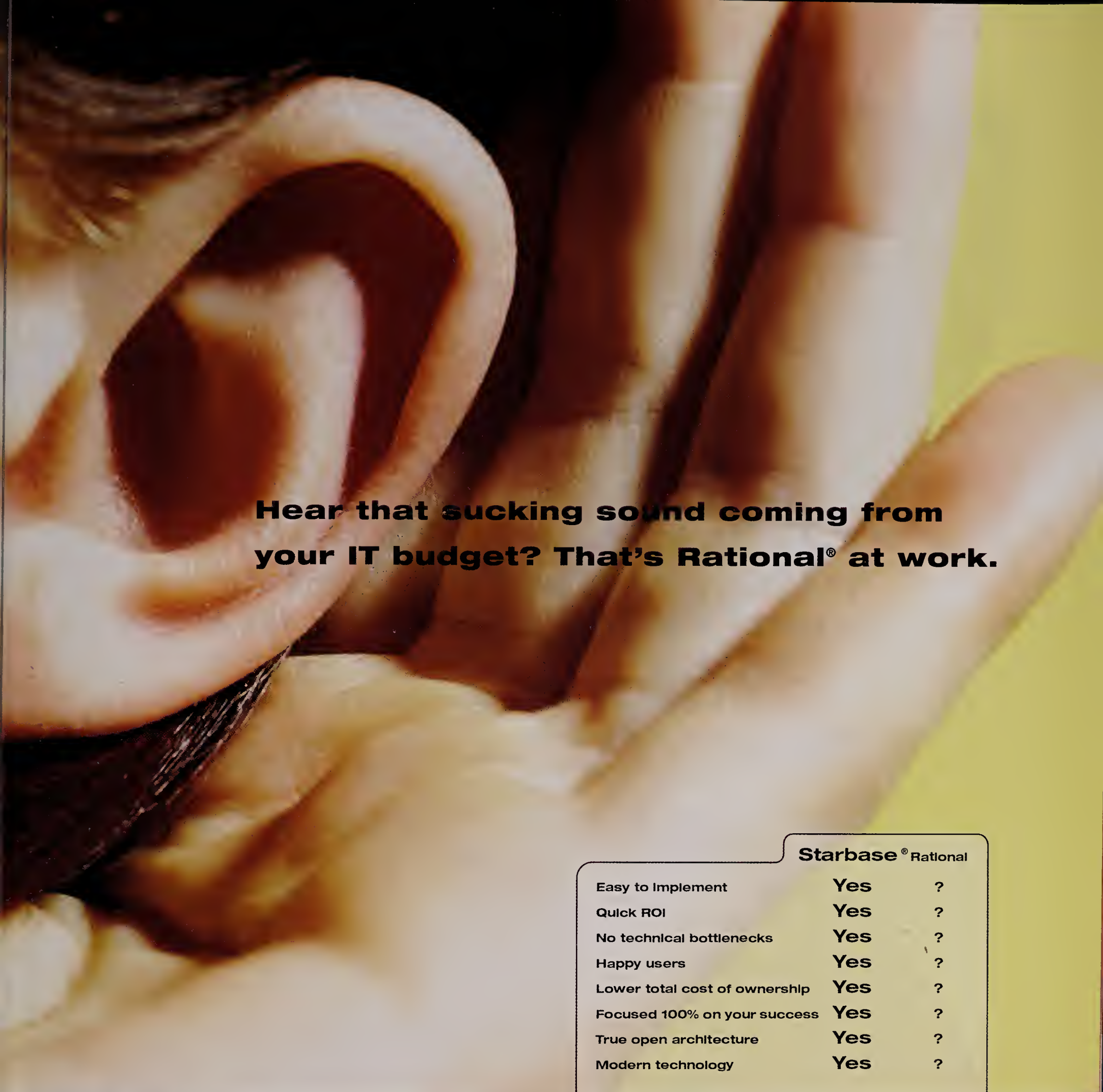
With our new awards, we salute the individuals behind the IT achievements.

By Abbie Lundberg

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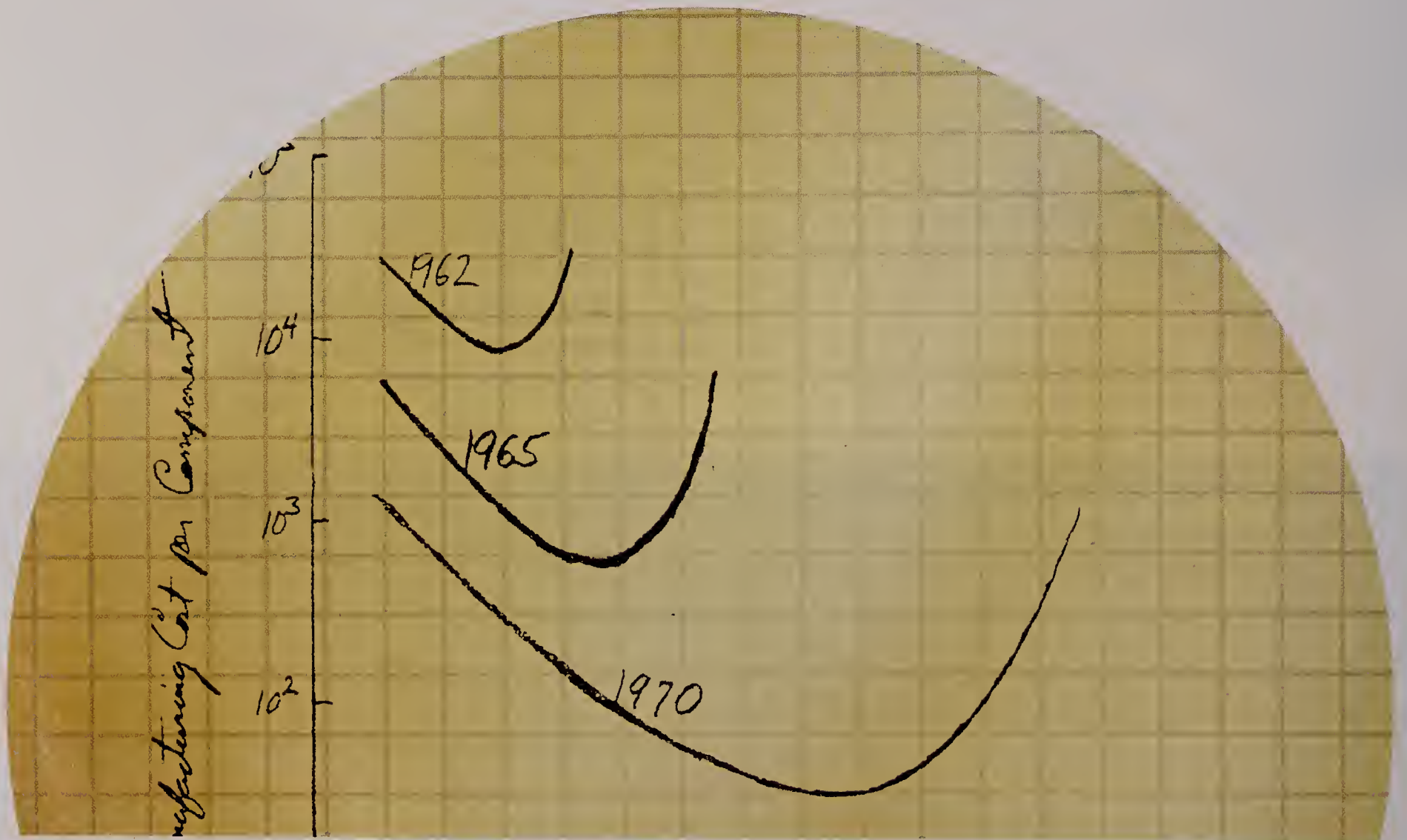
Will Moore's Law stand forever?

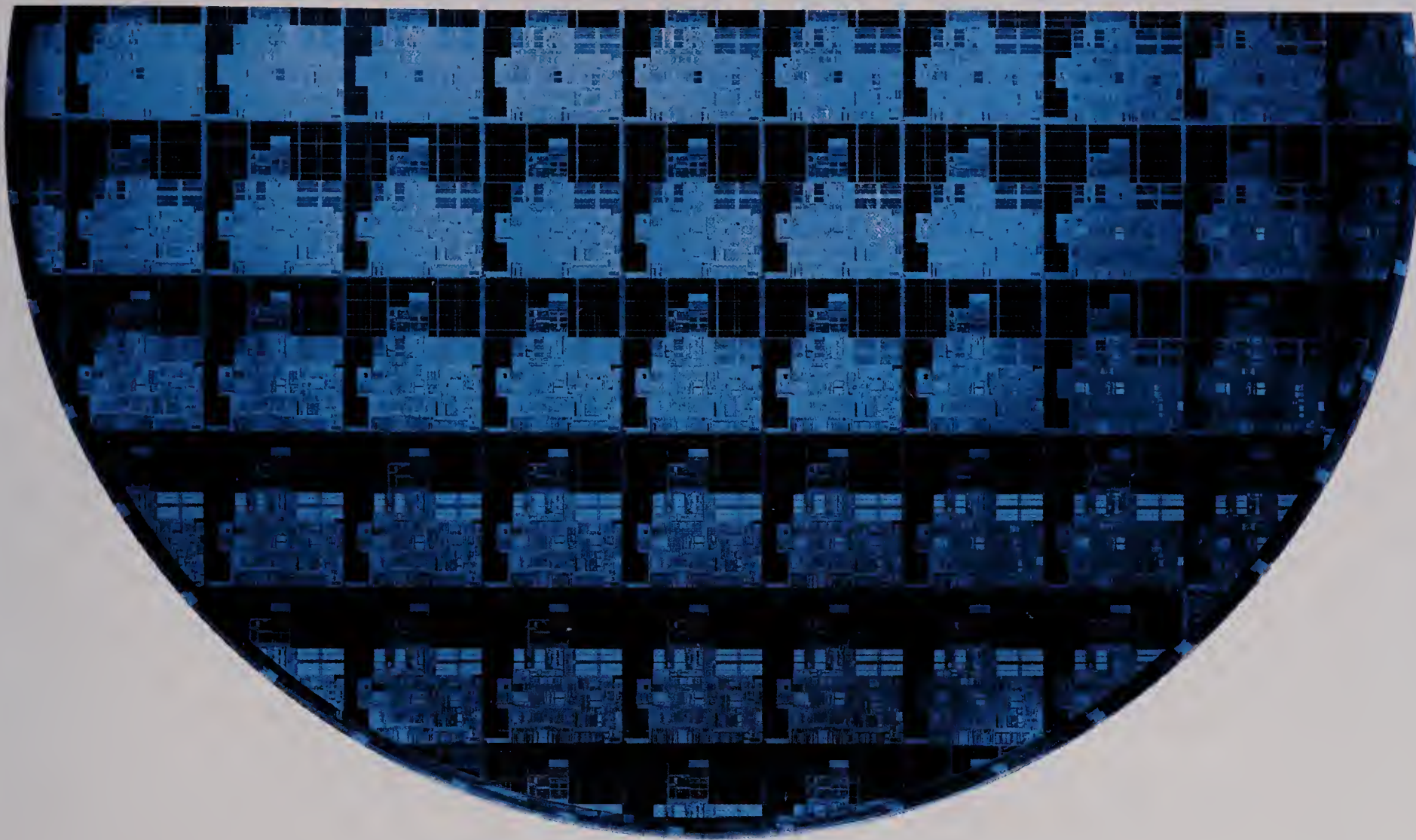
In 1965, Intel's Gordon Moore created a "law" that became shorthand for the rapid, unprecedented growth of technology. He predicted that the number of transistors on a chip would grow exponentially with each passing year.

At the time, even Gordon never imagined it might still be true today.

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Gordon Moore sketched out the amazing pace of silicon technology development in 1965. His "law" remains valid today.





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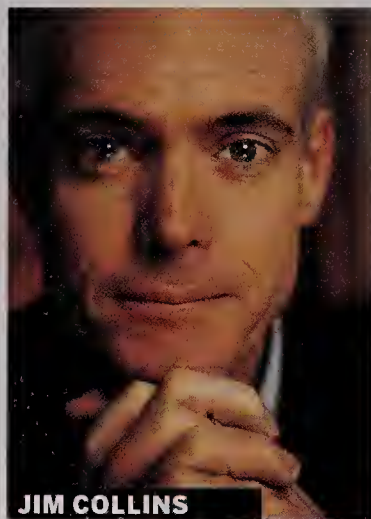
WEB >connections

Interactive features from October 1 to October 14

TALK BACK

Is it really leadership that makes the technology great?

Technologies are just so much R&D expense until they're deployed by those who have the vision to recognize the great ideas and the skill to implement them successfully. So says Jim Collins in **Leadership Makes Technology Work** (Page 102). How have you bucked the system to get the "great ideas" out into the real world? Share your secrets.



JIM COLLINS

WEIGH IN

Does technology need to change us?

According to Esther Dyson (**Technology Needs to Change Us**, Page 80), it's only those technologies with the power to change society that will really



ESTHER DYSON

last. All the rest, she says, will end up in the dustbin of history. Can you think of any technologies that have changed us and have not stood the test of time? Or some that haven't changed us and have stuck around? What do you think? Go online and tell us.

Find links to the stories mentioned above in the **WEB CONNECTIONS** box at www.cio.com.

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- **Executive Guides** provide the easy-to-read basics taken from Darwinmag articles on subjects such as ERP, infrastructure and programming languages.

Our Daily Web

MONDAY Tech Tact Technology Editor Christopher Lindquist on what's next.

TUESDAY Alarmed Security experts Sarah D. Scalet and Scott Berinato give you something new to worry about.

WEDNESDAY Metrics Web Writer Jon Surmacz makes sense of the numbers.

THURSDAY Sound Off Web Editorial Director Art Jahnke opines on ethical dilemmas.

FRIDAY The Big Picture Charts and graphs worth a thousand words.

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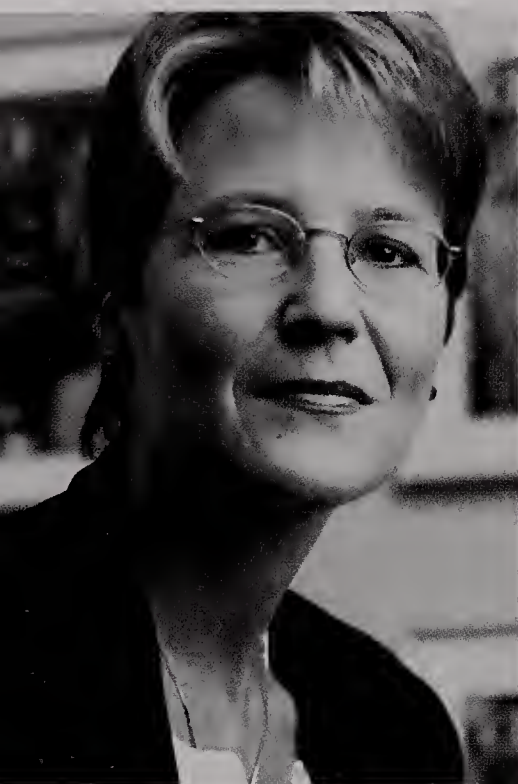


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From the Editor

lundberg@cio.com



For information on all of CIO's editorial awards programs, including how to enter, go to www.cio.com/awards.

Leaders of the Information Age

WE'VE CREATED VARIOUS awards programs at CIO to recognize the significant progress made in the use of information technology in business. The CIO-100 Awards, which seek out companies noted for their excellence in a particular business area, is in its 15th year. We've done the Enterprise Value Awards, which focus on applications that have delivered real value to the enterprise, for 10 years. During the early days of the Web, we also ran the Web Business 50/50 Awards to honor 50 Internet and 50 intranet applications. All of the thousands of efforts and accomplishments we've celebrated over the years have had people behind them, and we've noted that. But we've never had an award that directly honors the people themselves.

So this year we decided to do something that would put the individual at the center, with the selection of honorees based on the cumulative effect of each person's accomplishments. We wanted to recognize that while organizations have done great things with information technology, there are always individuals behind these achievements, leaders who see things clearly and then make those things happen.

The 20/20 name signifies something besides clear vision. For technology to have an impact on

the world requires two sets of people: the inventors, scientists and vendors who develop the technology, and the businesspeople—primarily CIOs and CEOs—who apply it to a real business or organizational challenge. We have selected 20 people from both camps.

There are, inevitably, noteworthy individuals whose names you won't find on this list. Some who were brought to our attention had retired or moved on. While that by no means lessens the importance of their contributions, we chose to limit our list to people whose impact was current and ongoing. We also wanted to present a mix of technologies and industries; this influenced our selections as well. Finally, while we received some 300 nominations, many gifted leaders weren't considered simply because they weren't nominated.

There were remarkable people behind this project too: Special Projects Editor Mindy Blodgett, who helped invent this new awards program and led the issue team; Web Developer Diane Chen, who created an amazing website for the judging; Art Director Terri Haas, whose smart design provides the perfect setting for our honorees; Projects Specialist Tina Sousa (who, sadly, recently left the company); and many others whose creativity and fine work made this a standout issue.

Allie Lundberg

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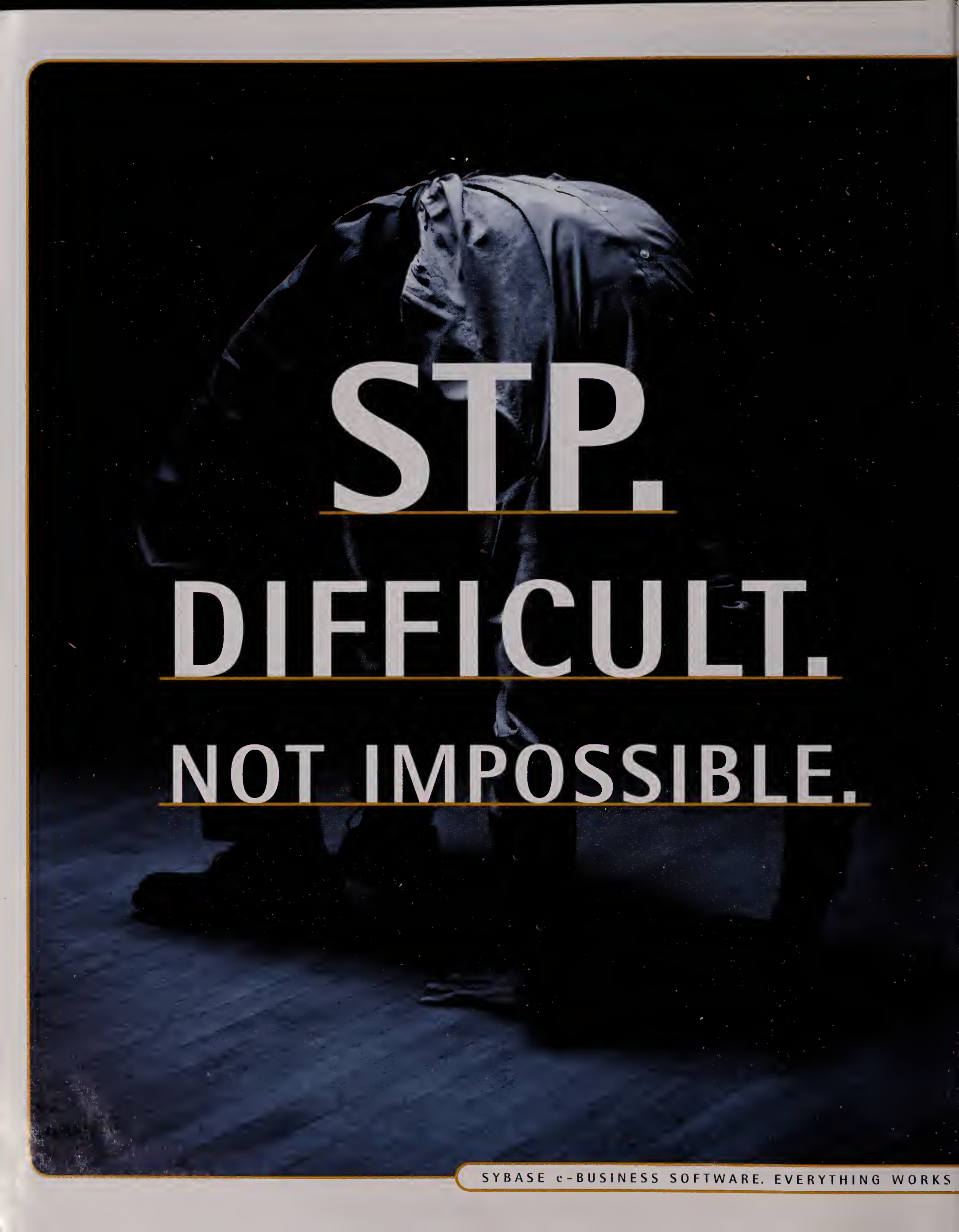
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A black and white photograph of a person wearing a dark, possibly waterproof, jacket. The person is bent over at the waist, with their head tucked down. The background is dark and indistinct. Overlaid on the image is the text 'STP. DIFFICULT. NOT IMPOSSIBLE.' in a large, white, sans-serif font. Each line of text is underlined with a thin horizontal line.

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Reader Feedback

WAL-MART'S I.T. STRATEGY IS AMAZING

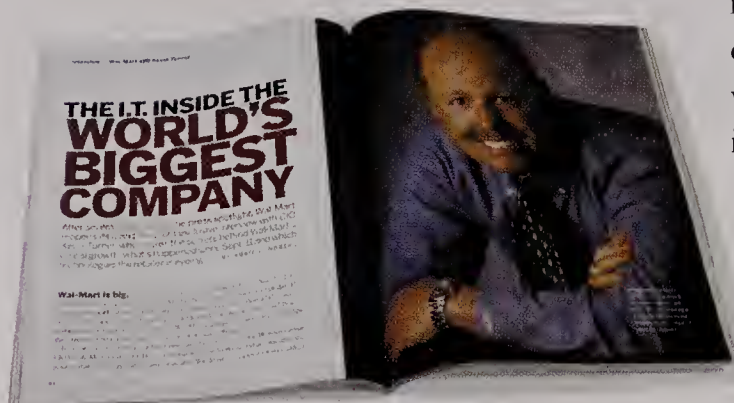
My first reaction after reading your article ["The IT Inside the World's Biggest Company," July 1, 2002] is WOW! [Wal-Mart CIO] Kevin Turner has his act together. He seems to have all the bases covered: from great requirements-gathering techniques right through test and delivery for application development; an open-door policy with employees and internal customers; actively participating in and anticipating future technologies; and having the time to proactively look for ways to improve his fellow employees' daily work efforts. As a consultant and instructor working with hundreds of managers, I can confidently say that Kevin is a manager to admire and emulate. His enthusiasm and love of his job came through loud and clear.

As I read your article, I wrote down some quotes. My favorite is: "Execution and discipline are not the enemies of enthusiasm."

I'm adding Kevin's quote to my toolbox for getting employees to feel more at ease with the change process.

Donna DeMarco • President and CEO • Lighthouse Solutions
Fleetwood, Pa. • donna@go2thelighthouse.com

[Editor's note: Kevin Turner's business mastery earned him a promotion to president and CEO of Wal-Mart's Sam's Club within a month of the article.]



I admire the way Kevin and his predecessors have evolved the IS at Wal-Mart.

The idea of central IS is excellent, though after 9/11 it's extremely important to make sure that your one center is secure and monitors are in place. As Kevin says, it's a lot of money, but it's worth it until the technology vendors come out with something that would reduce the cost.

I truly admire the idea of the IS folks going out and being part of the front desk. This participation is extremely

important. Once the developers understand the function and get a feel for it by being there and doing it themselves, it gives them a whole different and much better perspective when they develop the code—compared with when they just sit at their desk and imagine what the customer is looking for. A majority of the delays in a software project life cycle are due to incomplete and incorrect requirements-gathering.

I wish Kevin all the best in his future endeavors, and I like his phrase, "We are merchants first, technologists second."

Asim Malik
Business Relationship Manager
Patni Computer Systems
Cambridge, Mass.
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[Editor's note: CIOs must find a way to help IT staff truly understand the business. Wal-Mart's approach is an aggressive and effective method. Another way is to have an IT person

shadow a user for a day. It's important that developers not only learn about the business but experience what it feels like to do business, including the hassles and hurdles that their users encounter every day.]

That was an extremely compelling interview—those are smart folks. As a leading executive trying to bring together a fusion of marketing science and enabling technology (in the framework of enterprise business analytics), I am particularly fond of Wal-Mart's realization that an integration of the business and technology is key.

Only when marketing research, database technology, CRM, business intelligence and advanced data mining techniques start to talk to people as well as systems, will we really be able to move forward efficiently. And that means the chief marketing officer as well as the CIO roles need to evolve to encompass each other more effectively. Wal-Mart gives us a good example to aim toward.

Raymond Pettit
Director of CRM
RoperNOP Consulting
Washington Township, N.J.
erpmetro1@earthlink.net

[Editor's note: We agree that marketing and the IT function must become more symbiotic. We've even seen situations where the CIO and vice president of marketing were the same person—and it makes sense in certain industries. For more on the marketing/IT connection, see "IT Versus Marketing: How to End the War and Profit from a New Relationship" at www.cio.com/printlinks.]

I see England. I see France. I see your company's underpants.



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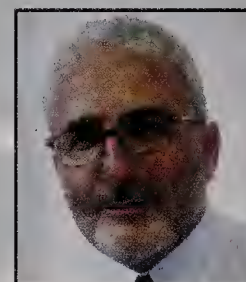
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Meet—and learn from—this year's award winners

Only a few organizations make the grade each year. CIO Magazine's Enterprise Value Awards are the most prestigious in the IT industry. Each winning company shares the good, the bad—and the just plain ugly—on how they built an award-winning system, and what value it brought to its users and to the enterprise.

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PETER WEILL
*Director, Center for
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The Magazine for Information Executives

GETTING SERIOUS

Your recent article ["Microsoft Gets Serious About Consulting," Trendlines, Aug. 1, 2002] wrongly concludes that Microsoft has created a new consulting organization to take over the prime role in engagements and compete with services organizations such as IBM Global Services and EDS. This is not only inaccurate but seriously misinforms the CIO community. Microsoft has had consulting services since 1990.

Our strategy has always been to enable partners and pull through products. In April 2001, the consulting services were combined with product support services to create Microsoft Services, a worldwide organization of 12,000 employees. About 4,500 of those are Microsoft services consultants. The remainder of the organization is comprised of support engineers

WHAT DO YOU THINK?

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and customer service representatives.

At Microsoft, we view services as a means to an end and have built an approach to services that is centered on delivering leading technology to and through our partners. Together, Microsoft and partners are creating a value proposition that allows customers to have more choice and flexibility in working, evaluating, acquiring and deploying new technology. This approach does not preclude Microsoft from taking accountability with enterprise customers; rather, it allows us to ensure the successful adoption of Microsoft technology and products.

The feedback we have received from CIOs regarding services is consistent with your article ["It's Time to Take Control," July 15, 2002]—they typically receive either too little involvement or too much control. As you point out in that article, CIOs are leading change in enterprise services. Microsoft's services approach embraces the preference to map the best mix of IT with the best mix of services, helping CIOs effectively control the successful use of technology to achieve optimal business results.

Bill Kilcullen

General Manager

Worldwide Services Offerings

Microsoft

Redmond, Wash.

billki@microsoft.com

[Editor's note: We stand by the conclusions in the article.]

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Website www.cio.com

Topic Experts www.cio.com/online_beats2.html

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Ask the Expert by Unisys

Paul Greenberg is the author of the best-selling *CRM at the Speed of Light: Capturing and Keeping Customers in Internet Real Time*, now in its 2nd edition from McGraw-Hill. He is also president of The 56 Group, LLC in Manassas, Va., a CRM consulting services company and can be reached at: paul-greenberg3@comcast.net

> *Is CRM still relevant in the organization today?*

> Absolutely yes. CRM is no longer cutting edge for the most part; rather, it is a necessary and integral part of an enterprise strategy. It is becoming more and more ingrained into the corporate personality, part of what I call the "customer ecosystem." We just have to get better at doing CRM.

> *Where does CRM seem to work best today?*

> Two areas come to mind. One is sales management, where CRM applications have definitely provided better forecasting and better anticipation of revenues. The other is call center applications, which while somewhat expensive have yielded measurable results, such as faster problem ticket resolution, less customer waiting time in the queue, and positive changes like that. Financial services companies have done very well by CRM, too, offering customers what they've always wanted—namely, access to multiple services and quick answers to questions. In all these areas, you have pretty good ways of measuring success, and therefore of calculating your return on investment. It's not always that way.

> *When CRM has not lived up to expectations, are there common reasons why?*

> CRM has too often been looked at in a left-brained way, meaning we look too much at functionality and statistics and the mathematical side of the applications. What planners often have not looked at carefully enough is the human and organizational side of the CRM equation. CRM success is closely tied to corporate culture and vendor/customer cultural alignment. For example, if a company has been historically revenue-driven and wants to implement CRM, it probably won't work too

well until the company ties sales compensation to customer satisfaction, rather than to contract closure.

> *What's different today?*

> The early CRM efforts were often big-ticket, enterprise-wide implementation attempts and many of them went badly due to poor strategic planning. The trend now is to use CRM to address a specific pain, such as a dysfunctional partner channel. However, it is critical to think about such incremental rollouts in terms of a wider vision for CRM, and enterprise strategy, because down the road you will want these incremental rollouts to be fully integrated into a corporate system.

> *Are there specific challenges to rolling out CRM globally?*

> Yes, and fortunately many vendors are taking these challenges into account. Their applications are multilingual. These vendors also appreciate the right-brain side of the CRM equation, meaning they know the importance of factoring in international corporate cultural differences, differences that are apparent in global rollouts.

> *So overall, you are bullish on CRM?*

> Yes, because done properly, CRM delivers real value, often in measurable amounts, too. I think we need to get better at some of these measurements, which often can be quite subjective. I also believe that the vendors and customers need to work for each other's interests a lot more than they do now. But we are ultimately talking about more satisfied customers, and we all know the value of that.

Done properly, CRM delivers real value, often in measurable amounts, too ... we are ultimately talking about more satisfied customers, and we all know the value of that.

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trendlines

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Edited by Lafe Low and Michael Goldberg

GOVERNMENT I. T.

Uncle Sam Wants Web Services

WHEN MARK FORMAN TALKS, people listen for two reasons. As associate director of IT and e-government at the Office of Management and Budget (OMB), Forman is using information technology to make the federal government more efficient and more responsive to citizens, all while ending a legacy of information silos that guards the bureaucratic status quo. You might say that Forman is doing a deity's work. And everyone who believes in better government is rooting for him.

The second reason people listen to Forman: Government is where the IT action is right now. As stagnant IT spending talk continues among corporate CIOs, another federal budget year begins this month and you can hear the dollars whooshing through the halls of agencies large and small in Washington, D.C. (see "Going Up," below). The OMB projects the federal government will spend nearly \$53 bil-

lion on IT in fiscal 2003. That's a 25 percent hike from just two years ago.

It's no wonder then that Forman, who directs the activities of the federal CIO Council, was one of the featured speakers at a Web services conference this summer in Boston sponsored by The Open Group (www.opengroup.org). To Forman, Web services (built so that applications can talk to each other using Internet technology standards) are vehicles for integrating systems and business processes across all those agency silos—and a way to catch up to the use of IT in the private sector, which he said is traditionally two years ahead of government.

"We've got to adopt simple business processes. We have silos of information that we must simplify and unify. The client/server systems [trend] of the 1990s was a boon for the bureaucracy because information is power," Forman said at the conference. "Basically [the OMB's agenda] is a vision of ERP."

But not just any kind of ERP. Think big scale. There are 22,000 federal government-hosted websites, with an estimated 180 million documents online. Every agency has its own payroll and procurement systems, and yet different agencies and cabinet departments have different ways of dealing with the public and each other. (The OMB likes to use e-mail to get comments from other agencies, but the Interior Department relies on mail and faxes, said Forman.) Then there's a need to automate data interchange between

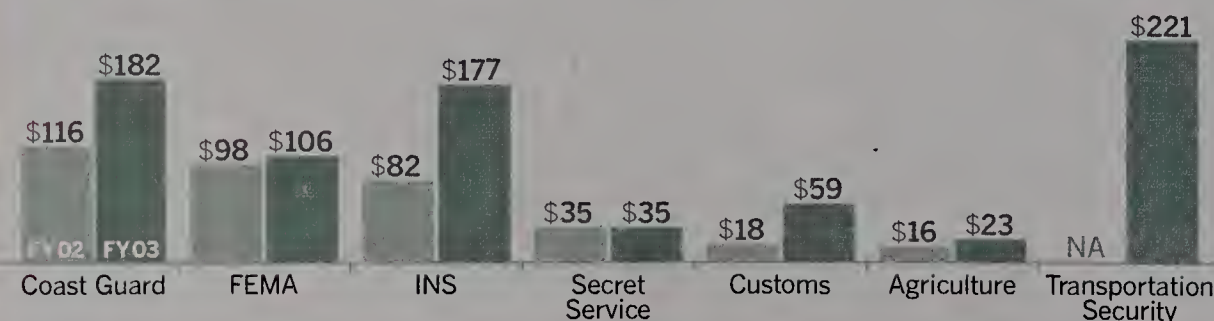
Continued on Page 28



Mark Forman, champion for e-government, seeks an end to IT silos in Washington, D.C.

Going Up

Most of the federal agencies that will make up the new Homeland Security Department propose IT infrastructure spending increases in fiscal 2003.



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I. T. E V E N T S

Fishing for an IT Hook

BOB YOUNG, known across the Linux community as the affable man who founded Red Hat Software in 1993 and turned Linux into a serious corporate option, has left his company (for more on Red Hat, see story on Chairman Matthew Szulik, Page 78). For Young's next act, he plans to make IT a hobby. He's using professional fishing as his model, and he's calling the venture Lulu Enterprises.

Young left Red Hat last year because the company got too big for him to manage. "Process management isn't a skill set of mine," says Young. "The fact is, it bores me to tears."

Young's new venture was inspired by his own love of bass fishing in his native Canada (he lost the family tournament this year) and his admiration for the Bassmasters fishing organization. "Here's a group that has 600,000 members, entirely built on enthusiasm for the sport, so much so that they can sponsor a bass fishing tour. There are people who make their living fishing for bass."

Young sees the same enthusiast element

in technology but no similar outlet for the enthusiasts. Enter Lulu Enterprises, based in Raleigh, N.C., which will set up events called Tech Circus, billed as an alternative to the typical trade show. Instead of expos for vendors and products, this circus will be driven by, Young says, enthusiasm, knowledge transfer and a decidedly noncommercial tilt. The circus will have (you guessed it) rings. An extreme programming ring, say. A Linux ring. A robotics ring. You can pay a little and wander, or pay more and take in specific seminars.

As for the name, Young's story is that his three daughters call him Papa Lu and he calls them the Lulus. Then he looked up Lulu in the dictionary, and it means "a remarkable person, object or idea."

Young is setting up Tech Circuses on the East Coast, the first slated for Sept. 27-29 on the North Carolina State Fairgrounds in Raleigh. The second will be in Boston in December.



"It could be a spectacular failure," Young says gleefully. But don't bet against him. This is the same guy who donned a bright red felt fedora and ended up legitimizing Linux in the enterprise. —Scott Berinato

O P E N S O U R C E

Line Up for Linux

IN THE CROWDED JUMBLE of technology trade shows, the recent LinuxWorld Conference and Expo was tough to miss. More than 20,000 attendees packed San Francisco's Moscone Center to hear the computer industry's biggest players pledge their support for the open-source operating system—or at least their willingness to play along. (Full disclosure: IDG World Expo, which shares the parent company of CIO's publisher, produced the show.)

Among those diving into the Linux pool were Scott McNealy, chairman, president and CEO of Sun Microsystems, who debuted Sun's Linux version; Oracle Chairman and CEO Larry Ellison, who said the company runs its website and internal e-mail on Linux; and IBM and Hewlett-Packard, which both unveiled additions to their Linux-friendly product lines. Even Microsoft sponsored its first-ever booth at the show.

While these vendors ran with the Linux crowds, they also didn't lack for candor. McNealy said he was not about to become a devotee of free technology products. "I am a capitalist, and I'm not ashamed of that," he said in a keynote speech reported by the IDG News Service. "One of the ways that we will go make money is selling hardware. I have not seen the open-source equivalent of downloading a server over the Internet."

Uncle Sam Wants Web Services

Continued from Page 26

federal entities and 50 different state governments.

The former Unisys e-business vice president said the development of Web services will help the OMB and federal CIO Council develop a "component-based enterprise architecture that addresses the business lines, data, information and technology necessary to meet our missions," whether that means helping a business navigate export rules, helping a citizen apply for Social Security benefits or coordinating information among agencies under the Homeland Defense umbrella. All that to do, of course, while protecting citizens' privacy and national security.

It's a formidable challenge, but Forman thinks that not all of it should be daunting. "Reorganizing the federal government is very difficult. But providing services across agencies should not be very difficult," he said. "We spend a lot of energy justifying silos. Government has to become a click-and-mortar enterprise, from our customer interfaces to our supply chain."

—Michael Goldberg



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By the Numbers

By Lorraine Cosgrove Ware

Reduce Support Costs: Standardize Wireless Devices

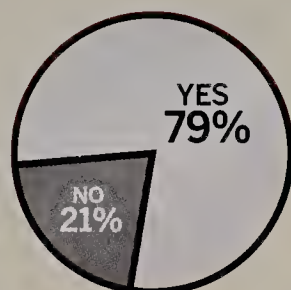
COMPANIES THAT HAVE already invested in wireless technologies are seeing the payoff of standardizing their users' wireless access devices. CIO's recent survey of wire-

less technology adoption ("2002 Wireless Update," available at www2.cio.com/research) found that the majority (79 percent) of the 266 survey respondents has standardized on wireless devices and is experiencing 24 percent lower support costs for wireless devices than companies that have not implemented wireless standards.

"IT departments want to deal with problems that are predictable, and they run into trouble and higher support costs when they have to support devices they're unfamiliar with," says Kevin Burden, IDC's program manager for handheld services (IDC is a sister company to CIO's publisher). "Standards help minimize the unpredictable problems." Companies are standardizing—meaning that the IT organization supports company-specified devices or applications only—laptops with wireless modems, PDAs and pagers most frequently.

IT Departments Enforce Wireless Standards

DO YOU ENFORCE STANDARDS FOR REMOTE ACCESS DEVICES?



CIO RESEARCH

Best Practices

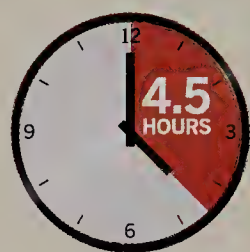
Have a standardization strategy. Companies need to standardize on a device or OS that best supports the applications. Determine what information needs to be accessed, by whom and from where, and avoid one-off applications designed to address a specific need. Make sure your wireless solution is scalable.

Predict problems. "Resolving a wireless user problem should become cheaper over time," says IDC's Kevin Burden. "Standardizing on devices really minimizes the unpredictability and increases the efficiency of the help desk."

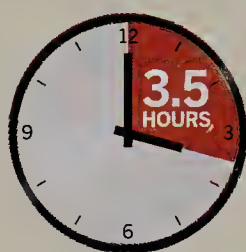
Understand the limitations of wireless. While WANs offer broad coverage, their performance can be slow. Wireless LANs are more convenient than wired LANs and more reliable for LANs, but they transmit data only for short distances (for example within a building). Determine how large an area you need to cover and the speed and bandwidth your applications require, for today and down the road.

Wireless Standards Save Time and Money

AVERAGE TIME TO RESOLVE USER HELP DESK REQUEST



Companies WITHOUT Wireless Standards



Companies WITH Wireless Standards

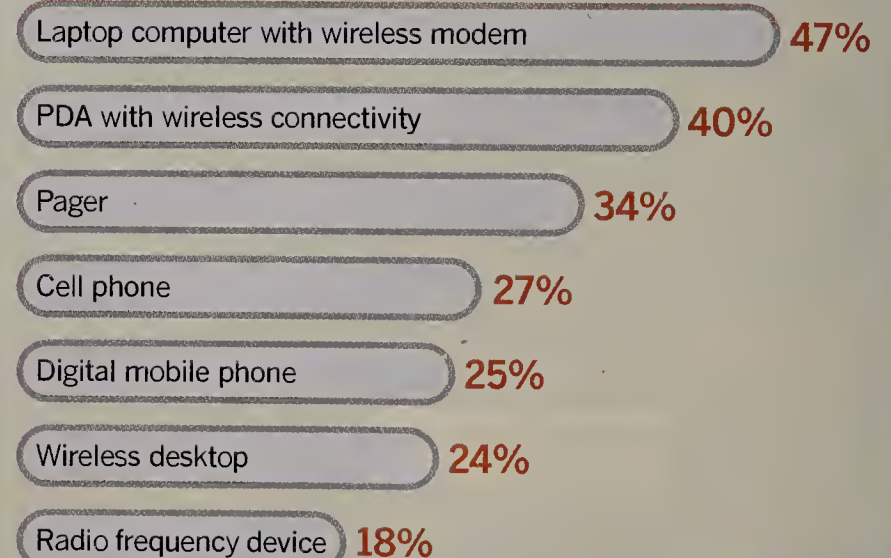


AVERAGE COST TO RESOLVE USER HELP DESK REQUEST

CIO RESEARCH

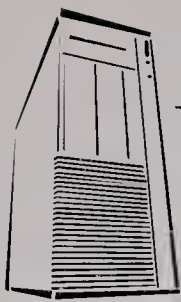
Laptops, PDAs and Pagers Top List of Standardized Devices

WHICH REMOTE ACCESS DEVICES HAVE YOU STANDARDIZED?



CIO RESEARCH

SOURCE: CIO'S WIRELESS UPDATE SURVEY OF 266 I.T. PROFESSIONALS, MAY 2002. (RESPONDENTS COULD SELECT MORE THAN ONE ANSWER.)



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Q & A: REGIS MCKENNA

The Job Just Got Bigger

AS IF CIOs don't have enough to worry about, marketing guru Regis McKenna argues in his new book, *Total Access* (Harvard Business School Press, March 2002), that they are now the guardians of customer strategy and outreach—functions once considered marketing's responsibility. When a customer has a problem and contacts the company via the Web or a call center, if that query is not resolved quickly and completely, the customer's trust in that company may evaporate. And who is in charge of the infrastructure that supports such crucial customer interactions? You guessed it: the CIO. *CIO* recently talked to McKenna about his view of the CIO's evolving role.

CIO: Customers still need to be catered to and their needs analyzed so that a company can keep improving its products and services, so why wouldn't the VP of marketing be in charge of what you call "total access"?

MCKENNA: The VP of marketing in most organizations doesn't have the skill to sustain the infrastructure that supports the marketplace. If I order a product online, who gets that information? Who tracks the product's delivery, and how does the system respond to that? The CIO has the technical skill to create and maintain the network that supports this interaction. If we look at who designed CRM applications, it was initiated by technical people—not by marketing people. Look at Tom Siebel or Larry Ellison—these guys had the technical skills to know how to apply those applications. Siebel was doing sales and customer support at Oracle. He was using customer technology to develop apps to support Oracle customers.

Most marketers have been trained in the art of how to change a customer's mind—not how to change a customer's experience. The CIO is directly in touch with the customer. After all, who had to design the interface with the customer? Who has to develop the feedback system that provides service and products directly to the customer? The CIO.

Are CIOs up to this task? And if not, how can they prepare for a role you call "chief total access architect"?

I think CIOs are every bit as up to the task as the marketing community. It takes people who spend time talking to customers to understand what they want.

Technology is taking the CIO into this role of increased customer interaction. The CIOs I have interviewed are aware of this. They have to understand what customers want in the retail environment. They have to understand the distribution channel. (For a good example of how one CIO got to know his business and its distribution network, see "His Side of the Mattress," Sept. 15, 2002).

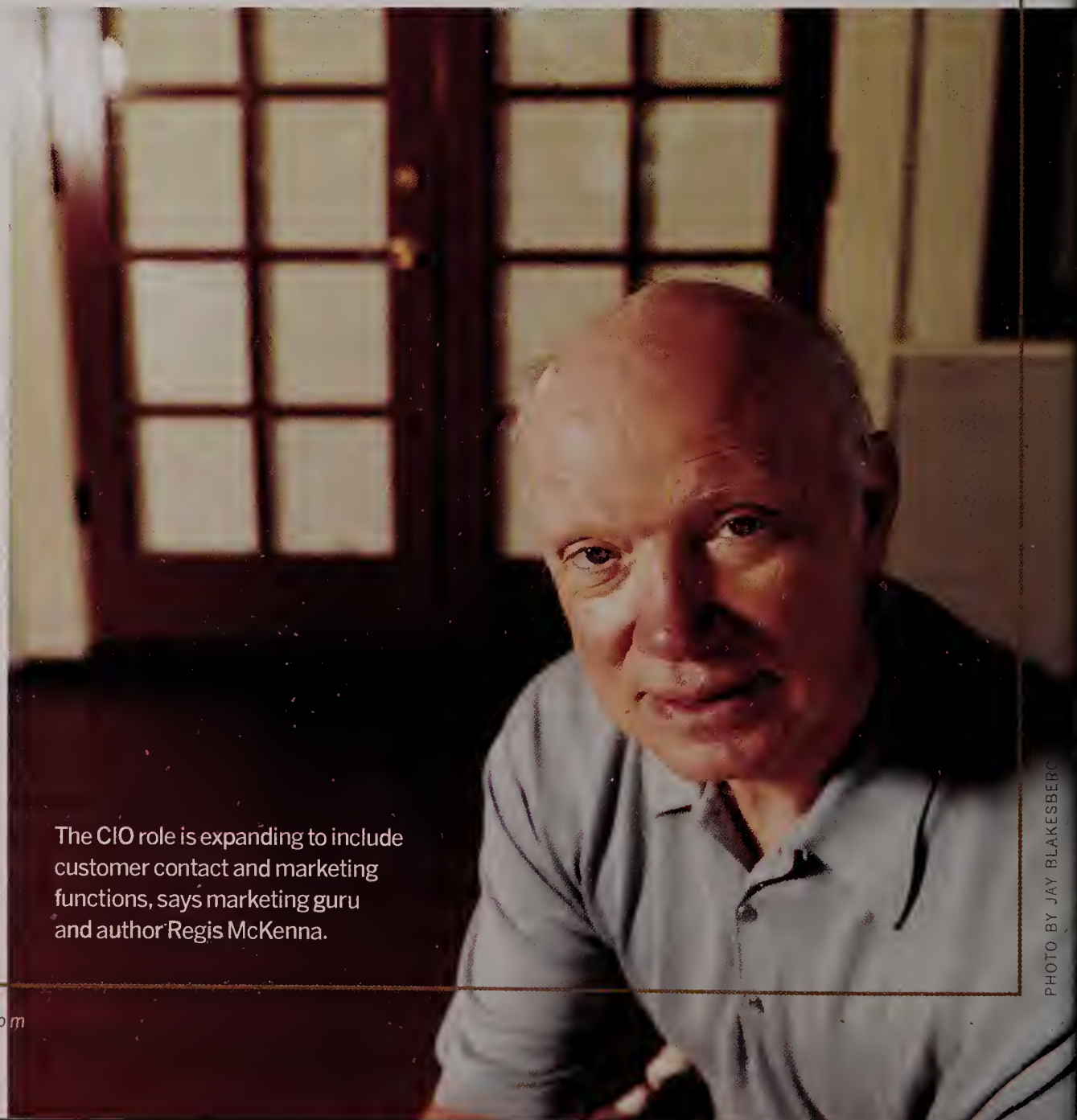
So who are the companies and CIOs doing this right?

Wal-Mart and Dell are places where the CIO is playing chief total access architect. Wal-Mart updates its customer database every 90 minutes and uses that to keep its inventory supplied. Marketing could never keep track of a customer that rapidly. Starbucks is becoming more dependent on its CIO and infrastructure.

But how will the CIO find time to handle this new role?

We know the CIO role is much more complex today, but one person doesn't have total responsibility anymore. There's a person who is the chief total access architect and then there are people responsible for the architecture. You see within a top IT organization a number of people in charge. They have to work together for a complete solution.

—Alison Bass



The CIO role is expanding to include customer contact and marketing functions, says marketing guru and author Regis McKenna.

PHOTO BY JAY BLAKESBERG

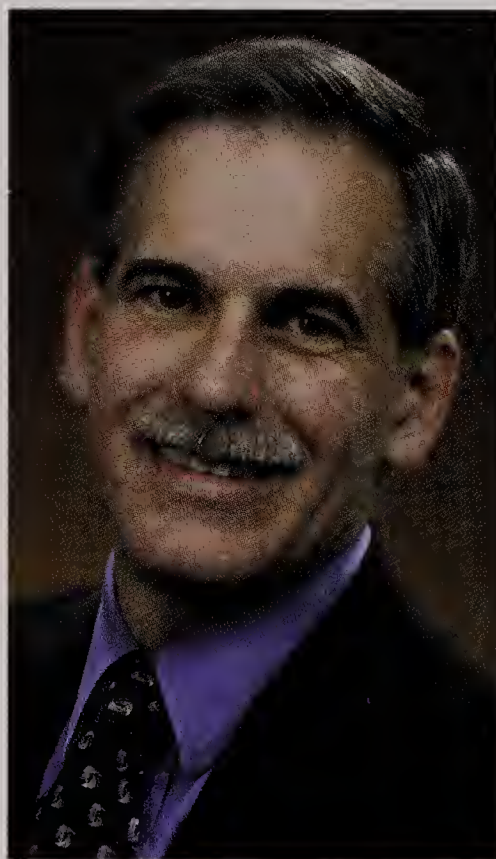
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What Every EXECUTIVE Needs to Know

YOU KNOW YOUR FUTURE DEPENDS ON THE ABILITY

to meet your partners and customers on their terms, at their pace, no matter the time of day or geographic location. And, of course, with minimum exposure to security risks that could compromise your service or even shut you down.

But unfortunately, your present is mired in the Internet infrastructure of the past. And if you don't tackle this



Jim Seligman, CIO, The Centers for Disease Control and Prevention: Infrastructure failure is not an option.

problem now with a business-driven strategy, then you're compromising your future success.

Times are still tight, yes, and the IT budget

is especially under the microscope. Yet you still depend on technical solutions that support your organization's needs.

Turn the page to read more about developing an e-business infrastructure, seven critical criteria for maximizing it, and several prominent CIOs who've made sound strategic decisions and are now reaping the benefits.

INSIDE SEE:

The 7 Criteria for Successful e-Business Infrastructure

Case studies with the CIOs of

- Saatchi & Saatchi
- The Washington Post
- The CDC

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CASE STUDY

Saatchi & Saatchi CIO: "Results Speak for Themselves"

For Laura Limbach, it was a simple business decision.

As worldwide CIO at Saatchi & Saatchi, the New York-based global advertising agency, Limbach was tasked with finding a way to maximize Web-based communication and collaboration among the company's 7,000 employees and 1,000 clients in 82 countries. But she knew there was no way the company could afford to build and maintain its own secure, scalable and globally-distributed e-business infrastructure. So instead she turned to Akamai and its EdgeSuite solution. Today, Limbach says, "The results speak for themselves."

Among the benefits Saatchi & Saatchi has gained:

- global end-user access to large multimedia files such as video;
- increased productivity and efficiency from enhanced communication;
- cost avoidance from not having to rollout and manage this robust infrastructure internally.



"As we focus on global accounts, our ability to collaborate globally is key," Limbach says. With the Akamai solution, Saatchi & Saatchi employees and clients have almost uniform access to the same multimedia content—no matter where in the world they're located. "Now everyone is in the same ballpark," Limbach says.

"As we focus on global accounts, our ability to collaborate globally is key."

— Laura Limbach, worldwide CIO, Saatchi & Saatchi

A FEW WORDS ABOUT E-BUSINESS INFRASTRUCTURE

Picture an urban infrastructure—the roads, bridges and power grids necessary to drive society. Now apply that concept to the Internet and its critical infrastructure—the servers, software, fiber and data storage that enable you to conduct e-business. When a supplier wants to coordinate a shipment, or when a customer wants to place an electronic order, they're relying on e-business infrastructure. Complex? Yes. Crucial? Absolutely. Think about what happens when traffic outgrows a highway or electricity demand overtaxes the power supply: gridlock. Same thing when your e-business infrastructure is overtaxed or even threatened. Except you don't risk just inconveniencing your customers, you risk losing them.

There are different ways to build and manage an e-business infrastructure. Some companies opt for a centralized model, where all of its components are housed and managed in a single location. This is good from a control perspective, but risky because all of the company's e-business eggs are in one basket—a single, vulnerable location that can't scale effectively to meet increased demand, and in fact puts the company at risk if disaster strikes.

To mitigate the downsides of centralization, some companies opt for "mirror" sites—geographically dispersed duplicate copies of their original e-business infrastructure that do improve availability and stability, but at a steep investment of time and money to establish and maintain.

There is also the distributed architecture approach, which relies on servers and networks dispersed globally in a powerful, redundant infrastructure that 1) gives the company a secure, accessible, reliable Web site, while reducing the cost and complexity of ownership and 2) provides customers all over the world with consistently quick, easy access to content, applications, and Web services.

Here's how some successful enterprises have solved their e-business infrastructure issues: Instead of building and maintaining their own complex infrastructures in-house, these companies have sought counsel and support from **Akamai Technologies**, the leading provider of edge computing solutions, delivering secure content and distributed applications across the Internet, intranets and extranets.

Akamai's global e-business experience unveils Seven Critical Criteria for E-Business Infrastructure—and the demonstrable results that customers have gained from teaming up with Akamai to tackle their e-business challenges.

The Seven Criteria

To achieve maximum efficiency, successful e-business infrastructures must meet these seven criteria:

FLEXIBILITY AND ADAPTABILITY

Even as you build your infrastructure to meet today's demands, you've got to have one eye toward tomorrow's. This means that your technology must be able to accommodate evolving needs easily and quickly. To accomplish this, IT architecture must use open standards, leverage existing technology investments, and support interoperability with internal and external services. At **MTV Networks**, Nick Rockwell relies on Akamai's efficient, distributed, high-performance infrastructure that "[spares] us the cost and headaches of continually building out to catch up with the exploding demand for our Internet properties."

At MTV Networks, Nick Rockwell relies on Akamai's efficient, distributed, high-performance infrastructure that "[spares] us the cost and headaches of continually building out to catch up with the exploding demand for our Internet properties."

GLOBAL REACH

Being global means reaching an audience of as many as 544 million Web users spread over 11,410 ISP networks—a costly and time-consuming challenge when you consider that a region such as Latin America has only a few megabits per second of connectivity to the United States. To achieve instant global expansion at high speed and low cost, **Terra Lycos U.S.** extends its e-business infrastructure by working with Akamai, whose platform covers 66 countries and 1,000 ISP networks. The results? "We're able to efficiently reach our worldwide users with timely, relevant content without over-provisioning our existing infrastructure," says Terra Lycos U.S.'s Chief Architect Vince Russo.

SCALABILITY ON DEMAND

This means that when the business grows, infrastructure and capacity grow with it. Last Sept. 11, **MSNBC** needed to scale to 91 million page views instantly as its audience tried to gain information on the terror attacks. By turning to a capacity-on-demand partner, Akamai, the news network was able to satisfy its needs without tying up millions of dollars in hardware that 90 percent of the time wouldn't be necessary. To have met this demand in-house, says MSNBC CTO Steve White, "We would have had to have 10 times the capacity sitting idle for 364 days of the year, which is ridiculous."

RELIABILITY AND AVAILABILITY

An e-business must be 24/7/365. The cost of an outage can be staggering in lost business and eroded brand equity. The benchmark for reliability and availability is the "five nines," as in 99.999 percent availability—this means less than five minutes of downtime over the course of a year. Achieving five nines requires redundancy and multiple access points to keep Web traffic flowing and safe—all of which is available in Akamai's distributed

platform. And whether you have one customer or thousands, in the U.S. or the Far East, each expects the same service. **Symantec**, for instance, has witnessed measurable performance gains in the delivery of an average of 12.7 million downloads of its security software daily. "Akamai continues to be a major component of our strategy for delivering unmatched performance on a global scale, while minimizing Web infrastructure burdens and expenses," says Mark Egan, Symantec's CIO.

PERFORMANCE

Give customers rich interactive features and a superior user experience. A distributed architecture avoids the bottlenecks common when centrally hosted servers attempt to meet multiple users' demands simultaneously. Jeff Stieglitz, global architecture strategist at **Toyota Motor Sales**, is a big advocate of Akamai's distributed content approach. "[It] results in better performance than traditional sites," he says, "so pages take less time to display."

CASE STUDY

CDC CIO: Infrastructure Failure Is Not an Option

Jim Seligman, CIO of The Centers for Disease Control and Prevention (CDC), based in Atlanta, thought he had a solid, fault-free Internet infrastructure—until a hardware glitch took down the CDC's Web site for seven critical hours last October, at the height of the anthrax scare. "We thought we had no single point of failure," Seligman says. "But we were wrong."

Today, the CDC mirrors its entire Web site on Akamai's global network, giving the health information agency the secure, accessible Web presence it needs—not just for the CDC's staff and associates, but also for the 4 million to 9 million people who visit the CDC Web site each month.

How critical is the CDC's Web presence? Consider that the agency's mission is to analyze health trends, discover outbreaks, assimilate information and distribute value-added knowledge to the public. "The Web is now the primary way we [fulfill this mission]," Seligman says.

A side benefit to distributing the CDC's Web content globally: The user experience is now much improved, Seligman says. Worldwide, users are seeing faster downloads and easier accessibility. As a result, international usage is up from single digits to 15 percent.

But beyond global usage, Seligman is pleased with the global presence—and protection—the CDC's Web site now has. "Now, regardless of whatever infrastructure failure we might have here," Seligman says, "the Web content is still out there and made available to consumers wherever they are."

"Now, regardless of whatever infrastructure failure we might have here, the Web content is still out there and made available to consumers wherever they are."

—Jim Seligman, CIO of The Centers for Disease Control and Prevention

"When people go to our site, they expect to see DVD cover art and hear sound clips," says Walter Kerner, vice president of technical services at Columbia House. Tapping into Akamai's network resources, Kerner says, "has helped to enrich the user experience without adding to our infrastructure."

SIMPLICITY AND UNIFORMITY

Resources are tight. A complex network infrastructure will only further drain those resources. To prepare, strive for simplicity and uniformity. Leverage the capabilities of a third-party vendor such as Akamai, whose global, in-place infrastructure enables companies to efficiently reach worldwide users with timely, relevant con-

tent. Look at ColumbiaHouse.com, whose customers constantly browse for and buy CDs, videos and DVDs. "When people go to our site, they expect to see DVD cover art and hear sound clips," says Walter Kerner, vice president of technical services at Columbia House. Tapping into Akamai's network resources, Kerner says, "has helped to enrich the user experience

and maintain strong customer service without adding to our infrastructure."

SECURITY

Protect the company's assets. Cyber fraud, distributed denial-of-service attacks (DDoS), viruses and other intrusions can cripple business. Web infrastructure must help balance access with security so that the right people have access and the wrong people and viruses do not. Today, organizations are spending millions of dollars to secure their networks and data assets. One way to maximize that investment is to leverage an e-business solutions provider such as Akamai, whose distributed infrastructure offers unprecedented protection from DDoS and other cyber attacks, as well as Internet outages. Jim Seligman, CIO of **The Centers for Disease Control and Prevention** (CDC), entrusts his network's security to Akamai and reports, "With Akamai, the CDC keeps its site available in spite of network interruptions, traffic spikes or cyber attacks." •

To learn more about these 7 criteria, download the complete executive guide, "Enabling E-Business Through Distributed Web Infrastructure," at www.akamai.com/7criteria.

CASE STUDY

Washington Post VP of Technology: "We need to be available"

When the terrorists struck last Sept. 11, nearly every major news organization in the United States struggled—some even collapsed—trying to meet the peak demand of Internet viewers who wanted up-to-the-second news reports. A notable exception was *The Washington Post*, which actually made news for being able to continue providing the news to millions of people worldwide.

And while the *Post*'s journalists deserve credit for their work, VP of Technology Eric Schvimmer and his team should also be noted for their efforts to make sure the reports were readily available to Web viewers wherever and whenever they wanted them. "Our main mission is to provide the news, but we also have a public service mission," Schvimmer says. "We need to be available."



In the earlier days of the Web—say, the 1996 election—the *Post* struggled to meet peak demands. But in 1999, Schvimmer sought assistance from Akamai's

"I don't want to manage a big server farm."

—Eric Schvimmer, VP of Technology, The Washington Post

global, distributed network. And the relationship had immediate payoffs: when JFK Jr.'s plane went down in the summer of 1999, the *Post*'s Web site stayed up. "That was the first time since I'd been here that we'd had a major news event without a [peak demand] problem," Schvimmer says.

In making his initial decision to seek external support, Schvimmer weighed the cost of building and maintaining the infrastructure in-house. But he quickly realized, "I don't want to manage a big server farm. That's not my business."

Today, Schvimmer measures the Akamai relationship's value in terms of cost-avoidance and value-add. Without having to foot the bill for extra hardware, software, staff or hosting space, *The Washington Post* has improved its Web accessibility and offerings. "We're now able to handle the [demand] spikes and cost-effectively handle new multimedia offerings that other companies are cutting back on," Schvimmer says.

About Akamai

Akamai is the leading provider of edge computing solutions, delivering secure content and distributed applications across the Internet, intranets and extranets. These solutions enable customers to achieve optimal results from their e-business initiatives, thereby reducing the cost of ownership, improving return on investment, and creating new revenue streams. Akamai's globally distributed edge computing platform comprises more than 12,900 servers in more than 1,000 networks in 66 countries, ensuring the highest levels of availability, reliability, and performance. Headquartered in Cambridge, Mass., Akamai provides services and world-class customer care to hundreds of successful enterprises, government entities and leading e-businesses worldwide. For more information, visit www.akamai.com or call 888-340-4252.

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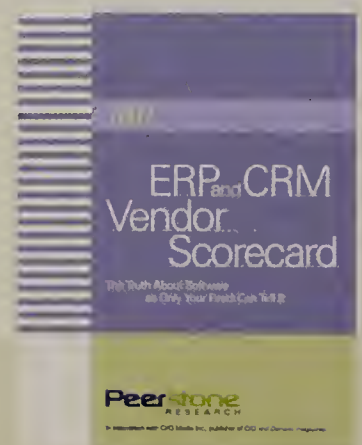
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SURPRISINGLY, MOST AGAINST LIFE'S UNPRE

BUT NOT THE PREDICTABLE ONES.



According to leading industry analysts, over 15% of laptops are lost, stolen or suffer hardware failure each year. With up to 40GB hard drives common these days, that's a lot of data at risk. Yet most companies still only think of backing up their servers. Which leaves all that data on all those PCs vulnerable. (And don't even get us started on the perils from hackers, viruses, losses, and user errors.)

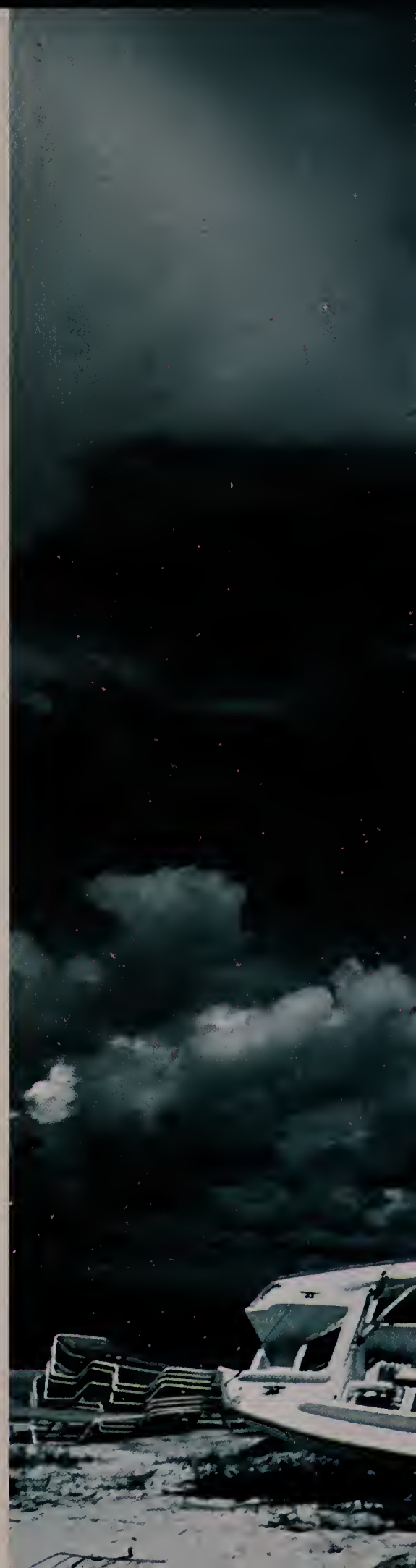
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**CIOS HAVE PROTECTION
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Jerry Gregoire | CIO Observer

Viewing the World Without Spin

A Seat on the Board

What's it going to take to get investor confidence back?
At least one top-flight CIO on the board of every Fortune 500 company.

GET A FEW BUCKS IN THE BANK and your name in a magazine or two, and solicitations for “angel” investors come at you faster than you can pretend to read them. Another prospectus arrived today, and there's a lot more wrong with this one than the fact that its covers are too far apart. The gold rush is never over, I guess. It's kept alive and kicking by rich/bored entrepreneurs who were smart enough to cash out of the dotcom rush early, poor/determined ones who weren't and the ever-hopefuls who missed the last wave completely.

A few good ideas and lots of bad ones. The worst ideas feature all the untested assumptions (and promise to repeat all the mistakes) that made the dotcom crash so inevitable. The big difference now, of course, is that it's OK for investors to ask the hard questions without being accused of not “getting it.”

My current favorite for fastest way to lose a fortune involves a startup in New England that wants computer-repair technicians to get their parts from unmanned depots, dispensed from what amounts to a vending machine (a very *big* vending machine). No cost-benefit analysis, no customers, a few hundred loose ends around the logistics—but the hook, the killer



app here worth throwing money at, is that the vending machines will call home via the Internet to report inventory. Jeez!

Listening to nonsense like that and watching my investments being ground to a fine powder got me wondering about whether things might have turned out better for the economy and investors had CIOs been more integral in the spending and development decisions made during the past 10 years. And I'm not just talking about technology decisions. I wonder how many bad ideas might never have been funded or how many good ideas might have been rescued from incompetent management or bad execution. Oh sure, CIOs are members of senior management, and a few are even showing up on the boards of high-tech companies, but how many CIOs or ex-CIOs are there on the boards of the Fortune 500? Are there many CIOs among the partners at venture capital firms, or is it always just about the IPO? The answers are: not many, no and yes!

ILLUSTRATION BY GORDON STUDER



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Hang around long enough and it hits you that the notion of progress and innovation as a continuum is nonsense. Time doesn't flow, it ticks, and between the punctuations of life and process-changing inventions, recycled ideas and gadgets rush in to fill the gap and keep us occupied. For example, Microsoft

These days, every significant investment decision made by a board has a technology or process component.

and the companies that will eventually manufacture the product have set Nov. 7 for the introduction of a device you won't want to miss—the Tablet PC, billed as a powerful, pen-based computer unfettered by a keyboard. This caps a two-year effort by Microsoft and others to generate excitement about handwriting recognition and digital ink.

I got my most recent reintroduction to tablet PCs right here in Austin, Texas, from some ex-Dell executives who founded Motion Computing, one of the dozen or so companies (including Fujitsu, Hewlett-Packard, Toshiba and other powerhouses) that will design and manufacture these devices and compete for your tablet PC dollars. Unlike most of its future rivals, Motion's offering will be a pure tablet, as in no keyboard at all (although one can be attached). Others have chosen to hedge their bets by taking pretty standard laptop designs and modifying them into hybrids whose keyboards can be maneuvered out of the way. The average price will be about \$2,500, or roughly \$800 more than a pretty good laptop and a PDA.

I know most of the founders, investors and management team of Motion Computing, and they're some of the smartest, most able people in this industry. But as I watched the demonstrations and listened to the development and marketing plans, I became concerned that they had overlooked the lessons of the past. Missing, not surprisingly, from Motion's executive team and board of directors is the participation of an experienced CIO, vital not only for her input as target audience but also as reference for why tablet PCs have failed in the past.

The first tablet I ever looked at was the GridPad around 1989 or 1990, while I was at Pepsi. At the time we thought it might have potential for a broad range of applications. Though it had only an 8088 chip, the pen demo programs were great, and the handwriting recognition, while not perfect, was good enough and would, I figured, get better over time. After months of development and testing, we decided the drawbacks outweighed the benefits and didn't deploy. The same went for the second-generation tablets from companies like Go Corp. and Toshiba's Dynabook. That the latest offerings haven't solved the problems of the ones that came before ought to be of great

concern to anyone thinking of investing in this technology.

One reason you may have heard for past failures was that handwriting recognition was unreliable. That wasn't the real problem. You could get recognition to work most of the time if you trained your hand to write like the software wanted you to. From what I've seen, improvements in handwriting recognition have come along at about the same speed as voice recognition—slowly and with no step function improvements.

Here are the actual reasons for past failures (which any CIO responsible for making technology buying decisions would tell tablet PC manufacturers to consider before investing millions):

- I type faster than I can write, and I can't read my own handwriting.
- I don't have to boot up a pad of paper or recharge the battery in my pencil.
- For casual data entry and retrieval and wireless e-mail, I have a \$300 PDA.
- Budgets what they are, I'm not sure my company should invest an extra \$800 per laptop, and...
- People drop things!

Here's a prediction: Tablet PCs won't be a hit. Most companies will stick with the more rugged "brick" devices for workers who have to move around a lot, consumers won't pay the extra bucks, and handheld computers are a serious competitive threat as they migrate up market. Every CIO I've talked to agrees, which makes me wonder, who are the tablet makers talking to? Who do their boards depend on for advice when considering massive R&D investments like this?

If you look at the composition of most boards, they're a collection of active and ex-CEOs, a consulting partner or two, somebody with connections in government, a CFO to chair the audit committee, and this or that professional board member to fill this or that special need. Scary, because these days, every significant investment decision made by a board has a technology or process component, recommended by a management team that may or may not have either the expertise or the objectivity to provide a full and fair assessment of its value or risk. Who on the average board has the technical expertise and battle-tested experience to protect the shareholders' interests? If there's no CIO on the board, the answer is probably no one.

Information technology has come to be the golem of many CEOs and boards: a lumbering, poorly defined servant too ugly to love and too big and important to ignore. Time to give the IT golem the respect it deserves and the attention shareholders and investors should demand. Time to make room for one more seat on the board. **CIO**

Are you on a board? Tell Editor at Large and former CIO Jerry Gregoire about it at jgregoire@cio.com.



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Michael Schrage | Making IT Work

It's All About the Execution

Go Full Circle

Doing 360-degree reviews of your IT staff will help manage user expectations

DO 360-DEGREE JOB REVIEWS remind you of that joke about the nattering egomaniac at the cocktail party: "Well, enough about me; let's talk about you. Tell me, what do you think of me?"

A 360-degree review process gathers feedback from multiple constituencies, including the business consumers of IT services. Every management team I know that's implemented one whines and moans about how painful and time-intensive the process is. Then again, every single group that's gone through that agony more than once asserts that the feedback is superior to traditional top-down one-on-one job reviews.

A third to a half of all IT organizations practice some sort of 360, according to various surveys. That's not enough. Any IT organization that genuinely cares about implementation and execution needs 360s. Badly. Not because IT has a miserable tradition of conducting performance reviews (although it does) or because IT doesn't always do the best job of working with other parts of the organization (although it doesn't). The main reason CIOs should embrace 360s, even if HR says "no," is that they represent a cost-effective way to align communication and expectations within the enterprise.

You can't manage successful implementations without successfully managing expectations. Indeed, the most brilliant and heroic technical implementation looks like a loser if expectations have been mismanaged. Conversely, a barely adequate implementation can look terrific if the client has bought into lowered expectations.

IT's reputation in many organizations has been poisoned by users and IT agreeing to unreasonable specifications and deadlines. But such dishonesty and ambiguous expectations simply can't survive 360s over time. (Actually, that's not quite true: Dishonesty and destructive ambiguity can survive any review mechanism that human organizations can devise.) Smart organizations build 360-review infrastructures into their service-level agreements. Indeed, even outsourcing should not be allowed to provide an escape from 360 oversight.

Well-crafted 360s can dramatically raise the cost of preserving dysfunctional management by making it more managerially expen-

sive to be dishonest than to be forthright. In fact, a reasonably good 360 probably could do more for MIS productivity than the latest suite of object-oriented development tools.

Instituting MIS 360s at one global professional services firm created an esprit that simply hadn't existed before. The 360s created contexts for conversation that made everyone think twice about what performance criteria mattered most. The department became more transparent to its clients as surely as its clients became more transparent to IT. Intriguingly, the review function made everyone more self-conscious about just how collaborative they were prepared—or not prepared—to be. The 360 created a virtual "cross-functional team" based *not* on performance goals but on performance review. Reciprocity can be a beautiful thing, no?

Good CIOs manage people well; great CIOs also manage expectations well. The 360s become a human "systems integration" tool, revealing exactly what kinds of collaboration lead to the most effective implementations. The CIO can see who does a better job of managing expectations than implementations—and vice versa.

Of course, 360s can yield personal insights that make personnel uncomfortable. One Asian regional IT manager of a global financial giant ruefully observed that he heard from his 360 review the sort of complaints his wife had been making for years. He said he was emotionally "stunned" by the consistency of the feedback. He couldn't dismiss the feedback precisely because it came from so many sources.

The catch for CIOs is that 360s inherently decentralize their power. Suddenly, it's not just the CIO's perceptions that determine the efficacy of their direct reports. Is that a risk? Of course. But IT is probably

better off trying to create mechanisms that give people more feedback about what they do well—and what they do poorly—than less.

This column will argue that better implementations are more likely to come from innovations in human behavior than innovations in digital technology. What makes 360s so powerful for IT is that they force technical people and businesspeople to communicate about something other than the immediate tasks, specs and deadlines at hand.

The 360s don't qualify as managerial panacea or productivity balm. But they do focus attention on the real implementation problems confronting most technically proficient IT organizations: institutional dishonesty and unrealistic expectations. **CIO**

Michael Schrage is codirector of the MIT Media Lab's eMarkets Initiative and author of *Serious Play*. He can be reached at schrage@media.mit.edu.



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CXO Perspectives

Views from the Executive Suite

Good Business Sense

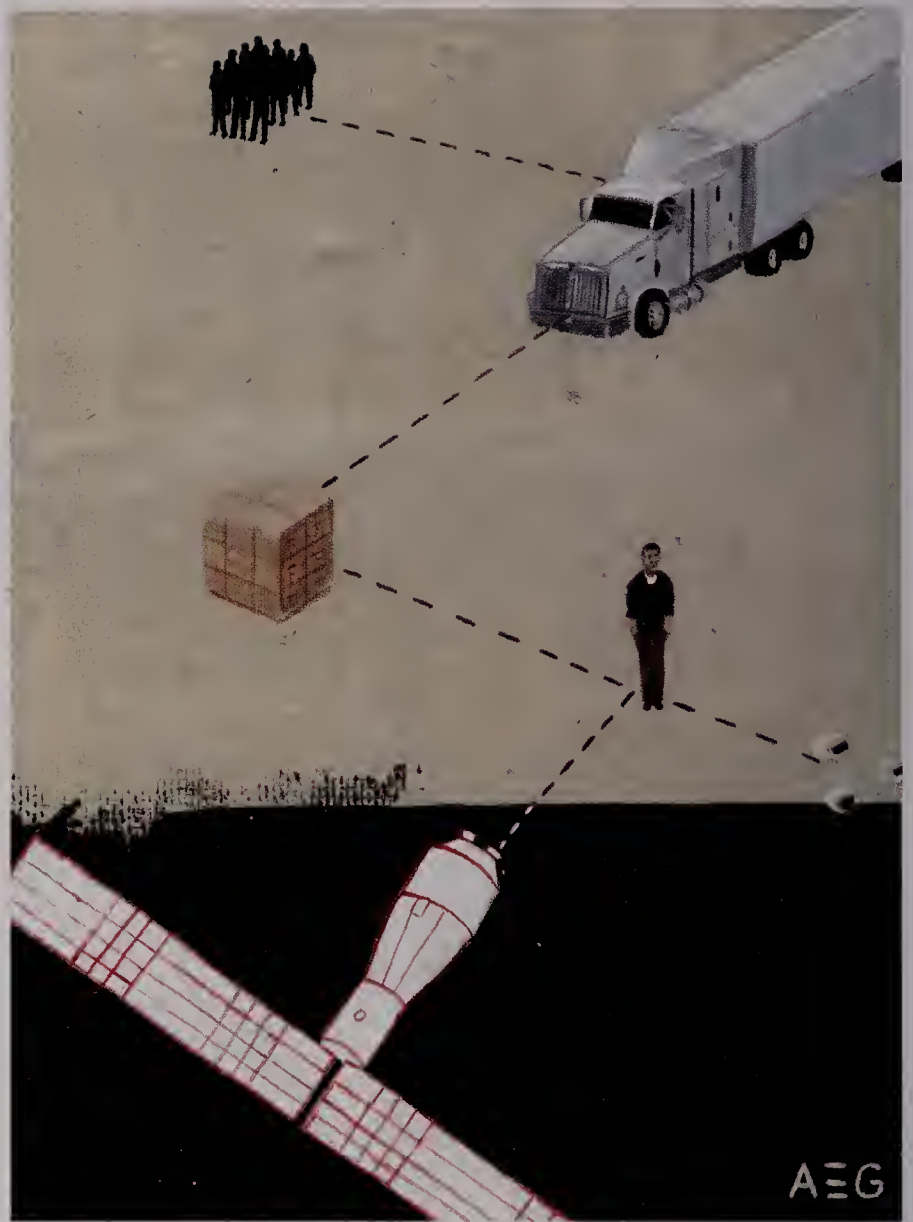
CXOs must immerse themselves in the IT planning process to ensure that technology investments pay off

BY CHRIS LOFGREN

WHEN PEOPLE THINK of the transportation and logistics industry, they usually think of trucks, trains, planes and ships before technology, but the industry has been completely transformed by information technology. My company, Schneider National, was the first company to deploy satellite tracking technology on its trucks nearly 15 years ago, and technology has always been the key enabler in our ability to compete effectively for the privilege of managing our customers' freight and logistics operations.

During the past six months, Schneider executives have spent a lot of time on the strategic planning cycle designed to drive our company's three-year business plan. As part of that work, we reviewed and discussed the vital linkage between business strategy and IT strategy. It should come as no surprise to readers of this magazine that business and IT strategies are inseparable. My goal here is to shed some light on how to successfully connect the two within the strategic planning process.

While it may seem painfully obvious to CIOs, many companies still do not recognize the full potential to be gained from integrating IT decision making with overall business planning. The integration should begin with a clear idea of the business



goals and key operating metrics that are the source of competitive advantage for the company. This process, in turn, drives the long-term vision for IT infrastructure and application development, which should be treated as key platforms that drive long-term positioning of the company. As such, business unit leaders must work together to formulate IT plans that support their individual groups, then roll up those plans into the overall corporate operating plan for IT.

Ideally, business managers should be deeply involved in establishing the case for IT investment, and they must prove that the technology is not only needed but will provide a sufficient ROI through lower costs or increased revenue. However, in most companies, the business units invariably want more technology than the IT department can reasonably design, build and deploy in a given year, and their wish lists usually cost more than the company can afford. So the methods that drive

ILLUSTRATION BY ARTHUR GIRON

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CXO Perspectives

prioritization and funding are critical to reaching the end state of having the right IT projects to support the company's growth strategy. In most cases, the factors for these decisions are not technological, but strategic and financial.

The linkage to business strategy demands that IT investments meet at least one of the following four criteria if they are to be part of a long-term IT strategy and worthy of capital investment.

Improve cost position. There is constant pressure in every company to reduce costs and increase productivity, as measured by revenue per employee. Technology plays an important role in speeding communication, filling and tracking

lines with Sabre, its reservations technology (Sabre was spun off in 2000), and Cendant with its reservations technology spin-off, Apollo—have created successful businesses based on technology that was pioneered for use in-house. These opportunities should not be overlooked. During the past 10 years, Schneider developed a suite of transportation and supply chain management applications used by our logistics group to manage outsourced freight operations and collaborate with customers' suppliers. By offering these same applications to customers, and even to some traditional competitors in third-party logistics, on a hosted basis via the Internet, we have created a new market opportunity and revenue stream for what was once merely viewed as a necessary IT cost.

While it may seem painfully obvious to CIOs, many companies still do not recognize the full potential to be gained from integrating IT decision making with overall business planning.

orders, and trimming SG&A costs by reducing dependence on person-to-person interactions. But proving the case for IT investments can sometimes be challenging. In many companies, there is often an assumption that automating a process with technology will somehow magically improve the process—or at the very least make it more efficient. That won't happen without focusing on the underlying business process. Since technology is merely the enabler, any plan for IT investment tied to productivity improvement should be connected from the outset to measurable improvements in operating and financial metrics.

Increase profit opportunities. The profit potential in transportation, as with other asset-based businesses like airlines and hotels, is derived from our ability to run more revenue over a fixed set of assets. Technology provides the raw computational power to help Schneider associates monitor the status and location of 14,000 truck tractors and 40,000 trailers across tens of thousands of locations throughout North America. To improve the real-time decision support capabilities of our customer service associates, we are deploying a technology application we call Network Value Engine (NVE), which is designed to help manage the inherent complexity of determining when, where and how to shift trucks into a market depending on our customers' immediate and long-term shipping requirements.

Create new revenue streams. In most nontechnology businesses, the IT department is not generally mandated with creating new software applications that can generate standalone revenue. However, many companies—including American Air-

sands of pick-ups and deliveries for customers—a process that is deeply dependent on technology. Our customers judge us on each and every interaction. Because customers tend to gravitate toward those partners with whom it is easiest to do business, technology plays an important role in developing and maintaining our relationship with them. While EDI remains a widely deployed communications standard, for many small companies it's costly and complex to implement and maintain. The Internet now allows us to expand the power of our network by facilitating fast, low-cost connections to our trading partners.

For many years, IT was viewed as a back-office function and attracted little management attention. In today's environment, poor IT decisions can have a significant and long-lasting impact on a company's market position. While some companies still view IT solely as a cost center, many others are beginning to recognize that IT can be the source of competitive advantage. It's not only an enabler of current business processes but also an engine for capturing new markets and business opportunities. The responsibility for making the right IT decisions should not fall to the CIO alone. Every member of the management team must be engaged in the process and willing to spend the time necessary to understand, support and ultimately drive the development of the right IT strategy. **CIO**

Want a CEO's perspective on a specific topic? Tell us at cxoperspectives@cio.com. Chris Lofgren is president and CEO of Schneider National, a \$2.4 billion provider of transportation and logistics solutions.



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Solutions Marketing Manager 9: Kelly Lindenmayer, Customer Operations Manager

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FEW QUESTION THE TRANSFORMATIONAL power of information technology, even during rough economic times. But there are people behind these transformations—innovative leaders with the vision to see where IT can make a difference and the will and focus to drive it there.

The CIO 20/20 Vision Awards honor outstanding individuals in two categories: 20 creators and marketers of technology; and 20 practitioners who use IT to make great things happen. In the first category, we have chosen scientists, inventors and vendor executives who have developed and evangelized the technology that has become so central to business today. In the second group are CIOs and other practitioner executives who have creatively, and with great foresight, utilized that technology to transform their organization and, in many cases, their industry.

This is not a popularity contest. For instance, while some high-tech leaders are revered for their brilliant inventiveness (such as Tim Berners-Lee, the architect of the World Wide Web) others (such as Bill Gates) have left disgruntled users, bitter competitors and other detractors in the wake of their drive to build software empires around their vision.

But in their own way, all 40 have had a profound impact on their organization, on business and on their industry. They share essential characteristics, such as the imagination to think big, the passion to go after what they want, the ability to take risks and the persistence to push for results.

HONORING THE PEOPLE WHO MADE IT POSSIBLE



CIO

20

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AND THE PEOPLE WHO MADE IT HAPPEN

20 WHO MADE IT POSSIBLE

OUR LIST OF TECHNOLOGY

developers includes not only the scientists who were able to act on their technology vision by promulgating standards and revolutionary tools but also a group of vendors who were able to build markets and deliver the tools to the masses. So we have Ray Kurzweil, a futurist and inventor who, with single-minded focus, created various artificial intelligence technologies, including speech recognition software used by doctors to dictate medical reports into a computer. Showing his range of vision, Kurzweil is currently at work on a book about reversing the aging process. Kurzweil maintains that progress is ever accelerating and by using mathematical models that factor in the exponential technology growth rate, he says that the next 20 years will yield as much progress as did the entire 20th century.

Also in this category is Berners-Lee, whose passion for the free exchange of information has been focused on the creation of Web standards, including HTML and XML. Today he continues to work diligently to keep technology specifications open and free in a

business climate, he says, in which companies are building "nuclear stockpiles of patents."

We also have honorees whose determination and marketing genius led to the adoption of several technologies we take for granted today. Tom Siebel of CRM giant Siebel Systems, is the epitome of this.

Given the competitive ambitions of some of our honorees, it's not surprising that several sit uneasily side by side on our list. Hasso Plattner, who cofounded SAP after his IBM employers wouldn't support his idea for financial software that did calculations in real-time, is antagonistic toward Larry Ellison, the master marketer behind Oracle. And, of course, there are the legendary rivalries between Ellison and Gates, and Gates and Scott McNealy.

20 WHO MADE IT HAPPEN

FOR ALL THEIR VISION, ambition and bombast, these giant market and technology builders would be nowhere without the practitioner leaders. Some of our honorees have used technology to bring about wholesale change in their industry. Hal Rosenbluth, CEO of Rosenbluth International, has used technology to simplify

the complex interrelationships in the travel business, thereby guiding his company to its current status as a world champion in corporate travel management and forcing rivals to follow in his footsteps.

Taking risks—knowing when to be leading edge or even bleeding edge with technology—is another key trait for the honorees in the practitioner category. David Kepler, corporate vice president and CIO at Dow Chemical, has deftly shepherded Dow's pioneering investment in a B2B electronic marketplace. Dow was also one of the first companies to successfully implement an ERP system. Another winning trait is being able to see clearly what is hiding in plain view. John Boushy, CIO and senior vice president of operations, products and services of Harrah's Entertainment, saw a way to use CRM technology to help expand his enterprise. This at a time when competitor casinos were betting on flashy performances and amusement parks.

Finally, our practitioner honorees all have mastered the ability to lead, which they embed throughout their organization. "When you reach a certain level of management, your effectiveness can be measured on how well you spread and share your abilities with multiple people. You have to be able to educate others and dis-

seminate best practices, both within and outside of your organization," says H. Stephen Lieber, president of the Healthcare Information and Management Systems Society, who served on the CIO 20/20 Vision Awards expert panel. One such example is UPS CIO Ken Lacy, who sees one of his main roles as building a team of high achievers who feel accountable and enabled to do their best. Dawn Meyerriecks, CTO for the U.S. Defense Information Systems Agency, knew that her goal of having empowered employees had been reached when, right after Sept. 11, she called her staff upon finding herself stranded out of town and was told that she should concentrate on just getting home; her colleagues were taking care of business.

All of our honorees have the ability to dream—but to also dig deep to find the ability to follow through. Harris Miller, president of the Information Technology Association of America, says that an IT visionary "needs to be looking over the horizon—but he has to be pragmatic. It's taking the technological tools that are out there and trying to apply them most effectively to real-world experiences."

Read on to find out how the CIO 20/20 Vision Awards honorees have managed to strike the balance between thinking big and delivering on their vision. **CIO**

AWARD METHODOLOGY

HOW WE CHOSE THE HONOREES

We used a multitier process for selecting the CIO 20/20 Vision Awards honorees. First, we put together an application seeking nominations of leaders in two categories: one for the creators and marketers of technology, and one for users and practitioners of technology—CIOs, CTOs and CEOs. This application was available online and open to anyone who wanted to nominate. At the same time, we convened a panel (see "Nominations Expert Panel," below) of leading business and technology gurus, industry experts and academics who nominated candidates in both categories.

Then **CIO** editors screened and judged the 300 nominees. After much debate and research, we selected a list of 40 whose vision, execution and impact changed the rules of business and even, in some cases, the way we live.

NOMINATIONS EXPERT PANEL

As part of the CIO 20/20 Vision Awards judging process, the following distinguished panel of experts, academics and consultants from various industries nominated candidates for our consideration.

Jordan Battani, Vice President, First Consulting Group (consultancy providing IT services to health-care, pharmaceutical and insurance agencies); **Pam Boschee**, Managing Editor, PennWell Corp.—Electric Light and Power; **Charles Andre Brouwers**, Vice President, The Boston Consulting Group (international strategy and general management consultancy); **Erica Drazen**, Vice President of Emerging Practices, First Consulting Group; **John Edwards**, Business and Technology Writer; **Robert W. "Doc" Hall**, Editor in Chief, *Target Magazine* (available through the Association for Manufacturing Excellence); **Dan C. Heinemeier**, CAE, President, Government Electronics and Information Technology Association; **Michael Krouse**, Regional Vice President, First Consulting Group; **Robert S. Langer**, Germeshausen Professor of Biomedical and Chemical Engineering, MIT; **H. Stephen Lieber**, President and CEO, Healthcare Information and Management Systems Society; **William W. Millar**, President, American Public Transportation Association; **Harris Miller**, President, Information Technology Association of America; **Bob Samborski**, Executive Director, Geospatial Information & Technology Association; **Jim Shepherd**, Senior Vice President, General Manager and Research Fellow, Enterprise Management Service, AMR Research Inc.; **Mark P.J. Sievwright**, President and CEO, Tower Research Group (consultancy specializing in technology in the financial services industry); **Zachary Tumin**, Executive Director, The Financial Services Technology Consortium (nonprofit professional association for the financial services industry); **Patricia Wallington**, Former CIO, Xerox Corp., now President, CIO Associates (provides businesses with computer-related support services); **Peter Weill**, Director, Center for Information Systems Research, and Senior Research Scientist, MIT Sloan School of Management

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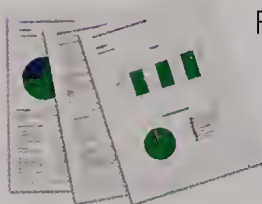
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2000 WHO MADE IT POSSIBLE

CIO MAGAZINE HONORS THESE 20 CREATORS AND
MARKETERS OF INFORMATION TECHNOLOGIES

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WORLD WIDE WEB
CONSORTIUM

VINTON CERF
Senior Vice President of
Architecture and
Technology
WORLDCOM INC.

ALFRED S. CHUANG
Cofounder, Chairman
and CEO
BEA SYSTEMS INC.

MICHAEL DELL
Chairman and CEO
DELL COMPUTER CORP.

JOHN DOERR
General Partner
KLEINER, PERKINS,
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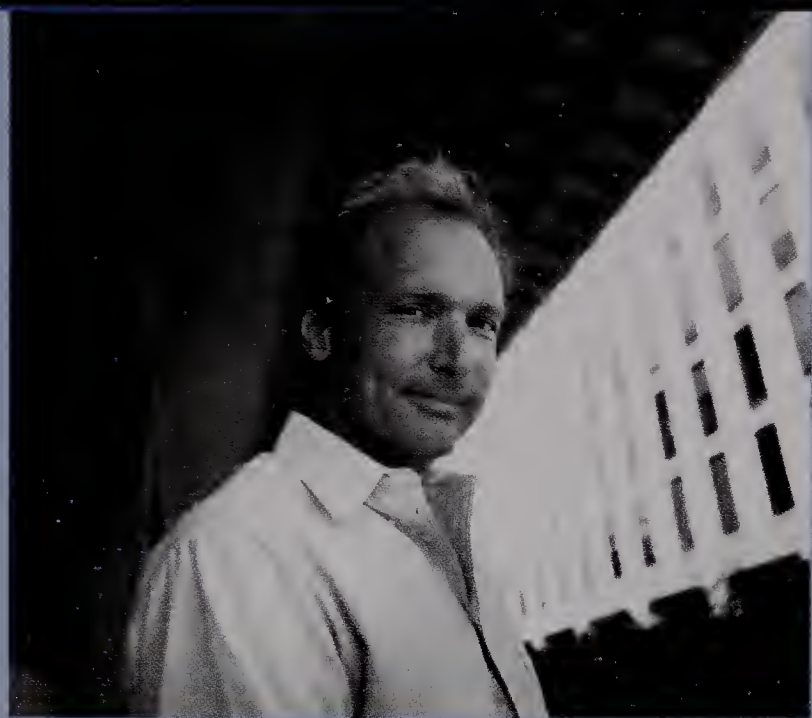
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RED HAT INC.



TIM BERNERS-LEE

Director

World Wide Web Consortium

Not satisfied with merely giving birth to the original concept of connecting textual data across computer networks (a laurel he modestly shares with the many people who helped him), Tim Berners-Lee, 47, wants to remove the remaining boundaries of the World Wide Web, which has changed the way the world does business. He was instrumental in the creation of the Cambridge, Mass.-based World Wide Web Consortium, which oversees the development of Web standards—including HTML and XML. Now he has focused his attention on the continued dominance of open standards, the power of Web services and—perhaps most important—the idea of a Semantic Web.

Today's Web contains oceans of data, though much of it is effectively inaccessible. Finding what you're really looking for almost requires a fortuitous accident. Current search engines are still clumsy tools that match patterns of letters, maybe blended with a bit of statistics about what other people found interesting. They can't identify related ideas that could be even more useful to the searcher. In Berners-Lee's vision, a Semantic Web would allow machines to quickly analyze huge amounts of data, recognizing connections between ideas and providing links to whole worlds of new and relevant information.

The project is still in the early stages, awaiting industry support, advances in artificial intelligence and search software, and other progress. But when it comes to fruition, it will prove that Berners-Lee's work in shaping the Web is anything but past tense. —Christopher Lindquist

Mystery Man

Tim Berners-Lee's website maintains a FAQ for the media listing dozens of questions he doesn't want to answer anymore. (Example: "Can you tell me more about your personal life?" Answer: "No, I can't—sorry.") Details about his life outside work are so sparse that published stories invariably repeat anecdotes from his 1999 book, *Weaving the Web*. His parents were mathematicians. He built his first computer with a soldering iron and an old TV. Such reticence around the press may be justified: Berners-Lee was once introduced on a CNBC program as the man who wanted to "control the Internet."

VINTON CERF

Senior Vice President of
Architecture and Technology
WorldCom Inc.

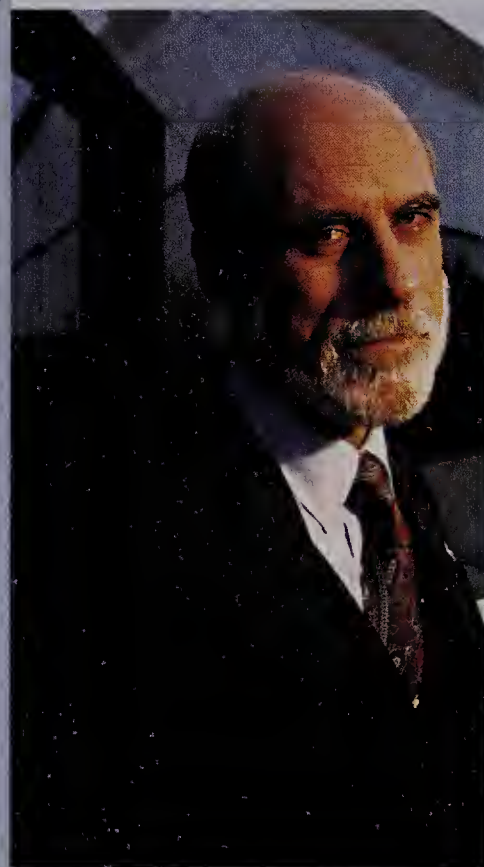
Vinton Cerf, the coinventor of TCP/IP, is the subject of dozens of media profiles. His views about technology are referenced and dissected in hundreds of Usenet messages. Politicians ask his advice. He is chairman of the board of the Internet Corporation for Assigned Names and Numbers, which manages the technical details of the Internet. Strangers send him e-mail describing how they tracked down long-lost family members online.

Last June, he had to fly to a meeting instead of helping Sigrid, his wife of 36 years, finish packing for a move to their new house west of Washington, D.C.

through its first schematic. Dismissing the days of dotcom greed, Cerf says, "there is still an underlying core of people committed to the Net as an idea." From a user's perspective, he says, "there continues to be a surprising amount of interest and willingness to put information on the Net simply to share it."

His natural stamina keeps him going. "He used to get up at 6 in the morning to go marching around with ROTC, and we'd have been working until midnight or 1 in the morning on some project," recalls childhood friend Stephen Crocker, who went to high school with Cerf in Van Nuys, Calif.

Although Cerf, 59, continues to focus on the Internet for Clinton, Miss.-based WorldCom, he manages to find some time to



Denying Paternity

Though he often gets credit for being the Father of the Internet, Vinton Cerf won't take it. "The Internet is an enormous, grand collaboration of people who were all swept up in a common belief that this kind of network could make a huge difference," he says. He counts many of his Internet colleagues among the people he most admires, including the late Jonathan Postel. He was, Cerf says, "modest and always trying to do the right thing."

"I did pack my sock drawer," he volunteers a bit sheepishly. "I can't think of anyone else who would put up with me."

He owes his frenetic pace in part to his continued stewardship of the Internet, almost 30 years after he and Robert Kahn talked

relax (perhaps with his favorite wine, a 1970 Beaulieu Vineyards George LaTour Special Reserve Cabernet). But he can't sit still.

His latest project? Helping NASA build an interplanetary version of the Internet.

—Elana Varon



ALFRED S. CHUANG

Cofounder, Chairman and CEO
BEA Systems Inc.

You won't hear people tell stories about Alfred Chuang break-dancing at Comdex, entertaining politicians at his Western ranch or browbeating analysts in closed-door sessions—although he could. Instead, you're more apt

to hear about the steady, reliable success of his company, BEA Systems in San Jose, Calif.

Before cofounding BEA in 1995, Chuang spent nine years at Sun Microsystems in a range of management positions. Widely acknowledged as a seminal relational database expert, Chuang's Internet credentials are top drawer. It was Chuang who prototyped the implementation of the TCP/IP protocol on the IBM PC. Though a few companies were working toward an Internet applications infrastructure before 1998, BEA was the first to put its money behind Java application servers in a meaningful way, says Deborah Hess, a senior research analyst with Gartner.

"They said, We're going to be an e-business company, long before anyone was saying that. It was truly visionary," says Hess. "BEA pretty much invented the term *Java application server*."

BEA cofounder Bill Coleman originally held the titles of chairman and CEO but turned them both over to Chuang in the past year. "I noticed a difference in the way the company reacted to

understanding of its position in the world and more proactive in response to that."

Chuang, 41, makes it a point to reach out to BEA customers. "He combines the inward-facing tech-

Initial Impressions

Alfred Chuang has ego sufficient to lend an initial to the company he cofounded in 1995 (he's the A in BEA Systems), but he was happy to share credit with his colleagues Bill Coleman (the B) and Ed Scott (the E). Seven years later, now chairman and CEO, Chuang is still careful not to hog the spotlight, says Mike Gilpin, research fellow at Giga Information Group, who has known Chuang personally for five years. "Alfred exhibits real respect for the leaders in his company," says Gilpin. "He has a very good personal leadership style. He's what some people would call a *mensh*."

changing market conditions," says Mike Gilpin, research fellow at Giga Information Group in Cambridge, Mass. "Under Alfred, the company is more realistic in its

nical understanding with an outward, real-world skill in knowing his customer base," says Gilpin. "It's a very effective combination."
—Tracy Mayor

MICHAEL DELL

Chairman and CEO
Dell Computer Corp.

Now here's a résumé that wouldn't make it past HR: One year of college. Worked for one company for 18 years with no promotion or even a boss who could be used as a reference. Unwilling to relocate.

In 1983, at 18, Michael Saul Dell began conducting business out of his dorm room at the University of Texas in Austin, selling custom-made PCs and components. A year later, with \$1,000 in startup capital, he officially set up his business and dropped out of the university, dashing his parents' hope for another doctor in the family. Today he runs the second largest (after the HP-Compaq merger) and still fastest-growing PC maker in the world.

A company known for its dominance with corporate customers, Round Rock, Texas-based Dell recently went from number five to number one with consumers in just 18 months with the help of quirky advertising and pricing that's driving the competition completely nuts. And they're making money. Lots of it.

Dell's continued spectacular performance through the downturn makes the compelling argument that Michael Dell is the greatest entrepreneur of our time. Indisputably brilliant, he seems to have few, if any, interests beyond his family and our industry. But that, of course, is the key. That is why Michael Dell is different from you and me: his single-minded, unwavering focus and obsession for that one thing.

Ask him what he's currently passionate about, thinking to draw him into a conversation about a hobby or a new venture, and he launches into a discussion about his company's direct sales model. Change tack and ask what,

beyond his company, excites him, hoping to hear something about social issues or his family's considerable philanthropic efforts, and you get a description of the shift from Unix to Linux. Finally, in desperation, ask, "So when you have a bad day at work, what other things do you imagine yourself doing?" and Dell replies, "I've been doing this for 18 years, and I have occasional bad days, but I don't think about doing something else. I think about what I need to do to fix it. I think I'm going all the way. I'm 37 years old, and we're going to see how great we can make this company."

—Jerry Gregoire



A Private Public Figure

Michael Dell is a seriously introverted and intensely private guy. Strange, when you consider that through his own efforts in press relations and his book, *Direct from Dell: Strategies that Revolutionized an Industry*, he's turned his face into the company logo, forever changing his private life and limiting his freedom to move around in public.

JOHN DOERR

General Partner
Kleiner, Perkins, Caufield & Byers

John Doerr invariably gets pegged as the man behind the Internet bubble, the brain responsible for putting Kleiner, Perkins, Caufield & Byers' capital behind Netscape, the mover who picked Amazon.com's business plan off the pile.

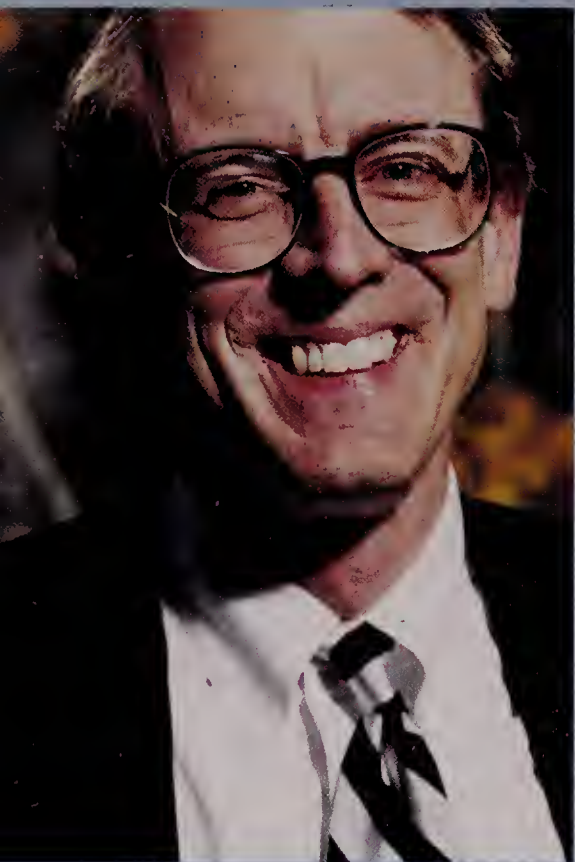
Doerr, however, does not see himself as the power others make him out to be.

"I'm uncomfortable when somebody writes a piece that says John Doerr or John and his partners were responsible for Amazon, America Online, Compaq or Netscape," says the general partner of the Menlo Park,

Doerr, 51, doesn't hide from the spotlight. Rather, he chooses to use the attention, and his wealth and power, to promote issues that are important to him.

For example, he and Reed Hastings, chief executive of Netflix, cosponsored a proposition, approved in 2000, that helps California schools pass construction bonds so that new schools can be built and old schools renovated. Now, swimming against the popular tide, he's lobbying politicians about the importance of stock options in promoting an innovative, growing economy.

Doerr is getting more attention these days for his political activity than he is for his business picks. Indeed, in 1999 there was speculation in the press that he was



Work-Life Metrics

The image of a VC during the Internet euphoria was of someone wedded to his job. And while über-venture capitalist John Doerr's name became synonymous with that image, in fact, he's always been a family man. He says his top priority remains being home for dinner 20 nights a month. "That's home and present for dinner—not taking phone calls or e-mails—by 5:30. I measure that month in and month out, and I'm achieving it."

Calif.-based firm, naming those brand names of the Internet era that, in fact, the high-powered venture capital partnership identified and backed. "Sure, we're proud of our involvement, but [Amazon's Jeff] Bezos, Jim Barksdale [at Netscape], Michael Capellas [at Compaq]—those are the executives who are on the line."

While he undersells his fame,

being considered as a vice presidential running mate for Al Gore. But he continues to search for the next Netscape, focusing on companies with the potential to solve global problems such as transportation, energy and the environment.

"Every one of us finds our own way to give back," he says.

—Meridith Levinson



LAWRENCE J. ELLISON

Chairman and CEO
Oracle Corp.

No one has ever accused Larry Ellison of being a geek. Tales of babes, boats and braggadocio dissolve that image. So it must irk the Oracle chairman and CEO to see his company, his leadership style and his personal wealth consistently ranked behind those of the Prince of All Geeks, Bill Gates.

Ellison, 58, is a worthy leader in his own right. Ken Jacobs, vice president of product strategy in the server technologies division (also known as Dr. DBA), was Oracle's 18th hire back in 1981. (Now roughly 42,000 people work for the company.) Even then, Ellison's intellect and charm were not lost on Jacobs. "He could see the promise of the relational database and what it could do for companies. He was the first to take advantage of that," says Jacobs.

Despite the woes the company has suffered in the bruising economy, \$9.7 billion Redwood Shores, Calif.-based Oracle remains the world's leading supplier of relational database software. "I've seen Larry lead through difficult times and energetic times. In all of those years, I don't think he has made a strategic mistake," says Jacobs.

Ellison rarely gets hung up on criticism, such as charges that the latest Oracle database releases have been full of problems. "Larry believes in innovating first and cleaning up the mess later," says former Oracle

Renaissance Exec

Playboy? Everyone knows about Larry Ellison's yacht racing and his plane flying, but he's also interested in cancer research and bioinformatics. He created the Ellison Medical Foundation to research the causes and effects of aging, as well as limiting the spread of global infectious disease. He's a history buff, and in what remains of his spare time, he studies Japanese art and culture.

honcho Ray Lane. One potential mess looming on the horizon is the lack of a successor. While Gates withdrew from the CEO position at Microsoft and named Steve Ballmer to the job more than two years ago, Ellison has taken no such action. The recent departures of key execs like Lane create a succession void. "Maybe it's easier to replace a Bill Gates than it is a Larry Ellison," cracks Jacobs. "He has so much strength of character. He's a pit bull when it comes to taking an idea and driving it forward."

—Lauren Gibbons Paul

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WILLIAM ESREY

Chairman and CEO
Sprint Corp.

Being in the telecom industry makes William Esrey feel like it's a dog-eat-dog world and he's wearing Milk-Bone underwear, or so the chairman and CEO of Sprint acknowledged during a speech at the Urban Land Institute last spring.

That doesn't mean he's letting the bastards get him down, though. In fact, while the telecom market has taken a pounding in recent months—both in value and prestige—the 62-year-old Esrey has emerged as a gentle cheerleader for the industry. The pervasive pessimism he hears signals a lack of vision, says Esrey, who has led the Overland Park, Kan.-based Sprint from being a me-too provider of long-distance services to a \$26 billion powerhouse. The future of the market, he believes, hinges on selling integrated offerings to businesses and consumers—the seamless combina-

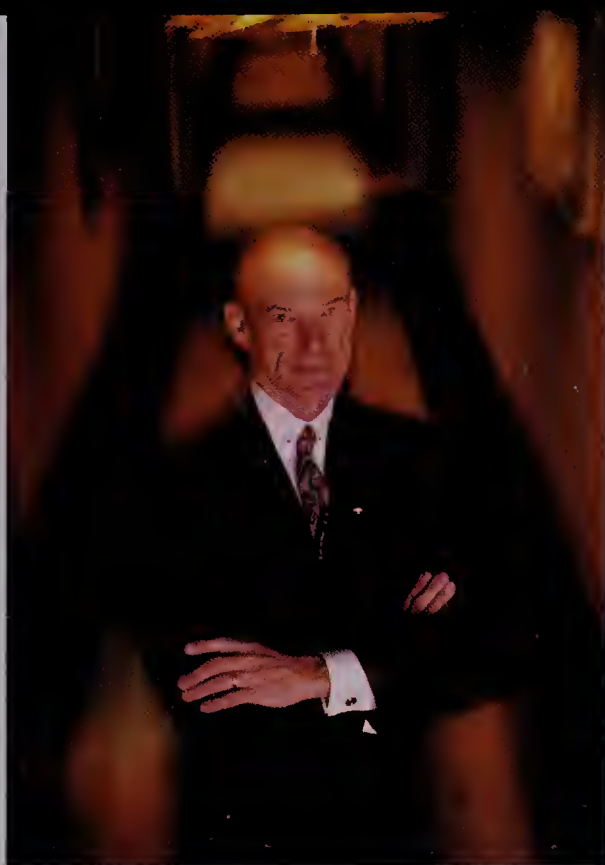
tion of traditional and wireless products.

Right now, Esrey is scrambling to take advantage of the opportunities that abound since the collapse of WorldCom. Sprint stands to benefit in WorldCom's wake as pricing pressures on the remaining telecom players will likely be lessened. "Esrey could not understand why his profit margins weren't as good as WorldCom's—now he and everyone else knows why," says David Willis, a telecom industry ana-

lyst for Stamford, Conn.-based Meta Group.

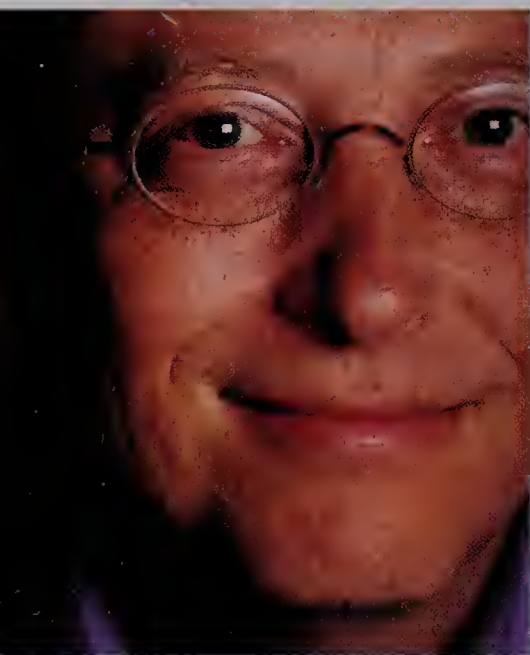
Just three years ago, he publicly acknowledged that the failure of a proposed WorldCom merger due to antitrust concerns had set the company back a bit. (Esrey even took a personal pay hit of 46 percent in 2000.) Now, it must seem like a huge stroke of luck. In this day of corporate greed and hubris, bigger doesn't always mean better.

—Lauren Gibbons Paul



If You Can Keep Your Head When All Those Around You Are Losing Theirs...

It's hard to find anything bad to say about someone who calls himself B.B., for Bald Bill. William Esrey's self-deprecating humor and concern for employees have earned him their long-standing loyalty—even post-layoffs. While the WorldCom merger was in the works, Esrey and his WorldCom counterpart Bernie Ebbers exhibited strikingly different styles. The former head of WorldCom, Ebbers is a "very gruff, no-B.S. kind of guy. Not very cordial in his leadership style," says David Willis, an analyst for Meta Group and a telecom industry observer. "Bill Esrey is a very personable guy. His employees have nothing but good things to say about him."



WILLIAM H. GATES

Chairman and Chief Software Architect
Microsoft Corp.

It's hardly a stretch to call Bill Gates a visionary. Nearly three decades ago, he foresaw that businesses and consumers would want personal computers. He also antici-

pated that the software running on them was where the profit lay. His dogged pursuit of that vision hasn't earned him a place on the most-loved executives list. Everyone, including the Justice Department, has lined up to take shots at him and his company.

Love him or not, the extent of his vision is unique. "We realized that software was the key to transforming PCs into powerful tools that everyone could use, wherever they needed them. That vision kept driving us forward," says Gates, who is 47.

Billg, as colleagues call him, has set his sights on the next 10 years as being the digital decade. "We'll see handheld devices that have the computing power and connectivity your desktop PC has today, enabling people to work, learn and be entertained wherever they are," he says.

As the PC industry continues to

evolve, so too does Gates. He took observers by surprise two years ago when he stripped himself of the CEO title and became chief software architect. "I've learned there are limits to your capabilities. You can't be everywhere and do everything," says Gates of his decision to name Steve Ballmer CEO.

This can't have been an easy move for someone who was used to having a hand in every decision of any significance throughout the 27-year history of Redmond,

Wash.-based Microsoft. His new role, he says, gives him critical "think" time to ponder where the market will go next.

"We're halfway to fulfilling the vision we had when we first founded Microsoft, for a personal computer that is totally intuitive and easy to use and that connects us with our professional and personal lives," Gates says. "There's still a lot of work to do, but I really believe we'll achieve the dream in the coming decade."

—Lauren Gibbons Paul

Windows on Another World

Like several others of his billionaire ilk, Bill Gates has used some of his riches to sponsor a charity foundation. Formed in 2000 with a hefty endowment of \$21 billion, the Bill and Melinda Gates Foundation has committed more than \$2 billion to, among other causes, global AIDS prevention and the Gates Library Initiative to bring computers, Internet access and training to libraries in low-income communities.



LOUIS V. GERSTNER

Chairman
IBM Corp.

If you're a CIO and you run into Lou Gerstner, don't forget to thank him.

Back in the '70s, negotiating with IBM was no picnic. So when things started to go south for the company in the '80s, we were positively gleeful at the idea of finally getting the upper hand. But as IBM's downward spiral continued, with the attendant layoffs in support and development, our smug satisfaction began to slide in the direction of panic.

Gerstner arrived to take the CEO position on April Fools' Day 1993, having previously served as

turnaround began in a tidal wave of layoffs, a cultural revolution for a company that was one of the first to provide group life insurance, survivor benefits and paid vacations. Next, Gerstner turned the company's focus from just hardware to software and services under the banner of IBM Global Services.

Not everything he did worked. Despite lavish investments in development and marketing, OS2 couldn't bump off Windows, and the diversion gave Sun and HP time to beat IBM at the Unix game. And IBM's PC business continues to circle the drain thanks to its inability to meet the "direct" challenge head on. But in the end, these missteps are inconsequential when compared

Sir Louis of Armonk

In June 2001, Lou Gerstner was awarded an honorary knighthood by Queen Elizabeth II. Gerstner, a U.S. citizen, was personally involved with IBM's Reinventing Education grant program, a partnership between IBM and the U.K. Department of Education. Unlike New York City Mayor Rudolf Giuliani, who received his honorary knighthood from Queen Elizabeth II at Buckingham Palace, Sir Louis of Armonk was knighted at the British Embassy in Washington, D.C.

chairman and CEO of RJR Nabisco and president of American Express. Five years later, the Armonk, N.Y.-based company posted profits in excess of \$6 billion. As one of the few non-IBMers around, Gerstner could be dispassionate about the difficult changes that had to be made. The

with Gerstner's resuscitation of an institution in which we had so much invested.

Gerstner, now 60, stepped down from the CEO position in March 2002. He continues to serve as chairman of the board, and he is writing another book.

—Jerry Gregoire

SUBRAH IYAR

Cofounder, Chairman and CEO
WebEx Communications Inc.

When Subrah Iyar pursues a customer, it's not as a salesman but as a suitor. He is energetic, sincere and charming—and he doesn't quit. "There is a leap of faith that early customers have to take," says Vivek Randive, whose Palo Alto, Calif., company, Tibco, was one of the first to use the Web conferencing services offered by Iyar's San Jose, Calif.-based startup, WebEx Communications. No one can predict whether such a relationship will work out. "We were buying into Subrah, his ability to lead, to manage," says Randive, who is also a WebEx board member.

WebEx CEO Iyar and CTO Min Zhu founded the company in 1996 with some software Zhu had invented but couldn't sell. They noodled for three years then scored with a set of inexpensive, subscription-based services that let users create online meeting rooms in which they can share documents and software applications with anyone who has a Web browser. Last year the company captured 58 percent of the Web conferencing services market, according to market researcher Frost & Sullivan.



Down, But Not Out

Subrah Iyar owes his current success to his biggest failure. In the early 1990s, he was on the team that marketed Apple's Newton. When it failed, Iyar felt as if he'd been jilted. "For a year," he says, "I was very cynical. I didn't have the energy, the drive" to start another relationship with a new technology. It took five years for WebEx to succeed, but Iyar had learned to enjoy the journey. "There is an inherent pleasure in building something," he says, "not looking for a result per se."

Iyar, 45, has grand goals—to see his product used by "every consumer," says the Mumbai native, who came to the United States in 1982 for its entrepreneurial opportunities.

Being the head of an online conferencing company doesn't keep Iyar off the road. He travels eight to 12 weeks a year to meet customers. "Our kind of service doesn't eliminate the need for face-to-face, because relationships are built face-to-face," he says. But without WebEx technology, he would travel a lot more—and spend even less time with his wife and two young daughters. As it is, he says, "if you ask my wife, I'm mentally absent though physically present."

Like many entrepreneurs, Iyar admits to being obsessed with his work but covets time to recharge. "I love to withdraw into solitude. If I go a week without getting that, I get totally frazzled," he says. —Elana Varon

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SECURING wireless networks —

INTEL IT'S SUCCESSFUL JOURNEY

Mobile computing wasn't enough.

True, the rapid spread of low-cost, high-performance notebook PCs had reaped great savings and efficiencies for Intel Corporation's global army of knowledge workers. By 2001, roughly 77 percent of Intel's knowledge workers in 45 countries around the world were using mobile PCs, and the results were tangible.

But Intel IT, the company's own technology unit, was convinced that these mobile workers would be even more productive if linked via wireless connection to the vast resources of the firm's enterprise network. Faster decision-making, greater sales-force efficiency, and higher employee satisfaction—all of these benefits were possible if Intel IT could deliver wireless networks. And if Intel IT could prove this case internally among its knowledge workers, the benefits of wireless networking could be extended to Intel's broader global workforce.

Anytime, anywhere computing became the goal. Deploying wireless local-area networks (WLAN) became the means to achieve it. Yet standing between Intel IT and its goal was an

"Pilot tests provide priceless feedback from users and help build a core skill in IT that can be used in deployment, while providing the data needed to select an infrastructure, architecture and design."

—John Johnson, director and general manager for productivity, collaboration and security programs at Intel.

imposing obstacle: developing and deploying a comprehensive security strategy amidst broad misperceptions that wireless communications are inherently insecure.

Pilot Tests: Validating the Approach to Security

Intel IT tackled the security issue head-on. The strategy: conduct a far-reaching series of WLAN pilot tests designed not just to help identify opportunities for increased worker productivity and savings, but also to pinpoint key security issues.

Intel IT wanted to prove that it could deploy wireless LANs to support anytime, anywhere computing, while simultaneously protecting the chip giant's intellectual properties and sensitive corporate data.

"Pilot tests provide priceless feedback from users and help build a core skill in IT that can be used in deployment, while provid-

ing the data needed to select an infrastructure, architecture and design," says John Johnson, director and general manager of productivity, collaboration and security programs at Intel.

Beginning in early 2001, Intel IT launched its pilot tests in earnest, addressing the technical aspects of security that stood between the group and its goal of providing global, mobile users with secure, radio access point links to Intel's 11Mbit/sec of bandwidth on IEEE 802.11b-compliant WLANs.

The Intel IT team quickly determined that the out-of-the-box Wireless Equivalent Protocol's (WEP) key creation scheme could only be used as one of several layers of security for their wireless pilots. The reason: It could allow an intruder with an antenna and a portable PC to tap into data transmissions from a parking lot or a nearby room.



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"We realized that WEP was fairly soft, and we weren't comfortable using it alone," Johnson says. "Senior management expected a very secure wireless environment capable of meeting the anticipated needs of our employees. We were prepared not to move forward and put the effort on hold if we couldn't find a security plan that met our requirements."

Enter virtual private network (VPN) technology. Intel had already harnessed VPN to

By the end of the testing, Intel IT had met two huge goals: substantiating the ROI for the technology and validating its security blueprint.

Beyond answering inherent questions about security, Johnson says, the pilot tests helped Intel IT workers gain new confidence in wireless technologies. "IT groups should not be scared about getting into wireless," he says, "because we found that many wireline networking skills can be applied to wireless."



"If I were asked by another IT manager whether to proceed with wireless LANs, my answer would be an emphatic *Yes!*"

—John Johnson, director and general manager for productivity, collaboration and security programs at Intel.

protect its wired remote access systems. Now Intel IT decided to make VPN serve double-duty to protect its wireless networks as well. Intel IT augmented WEP by equipping notebook computers with VPN client software, backed up by VPN gateways behind radio access points. VPN technology supports three additional methods for protecting data and communications, enabling Intel to encrypt all airborne data. "We've found VPN to be very secure and cost effective," Johnson says. "What we like about it is that we can use the same technology internally to secure our wireless environment and externally to enable secure remote connections via the public Internet."

Intel IT also decided to employ wireless LAN sniffer devices that can constantly scan the networks for unsecured wireless LAN traffic. With a vigilant eye to the future of security, Intel IT is looking forward to upgrading to new 802.11i wireless standards (pending approval by the IEEE) to achieve even more advanced encryption and higher levels of user authentication.

Broadscale Deployment: Intel Goes Live With WLAN

Buoyed by the results and lessons-learned from its WLAN pilots, Intel IT marched forward with its plans to broadly deploy secure wireless networks.

READY TO TAKE THE NEXT STEP?

Whether your next step is undertaking your own wireless LAN pilot or doing more research on wireless topics, you'll find these valuable how-to guides, case studies and white papers at:

www.intel.com/go/wireless

- Five Steps to Deploying a Wireless LAN
- Wireless 802.11 Security in a Corporate Environment
- Intel IT: Building the Foundation for Anytime, Anywhere Computing

source: Intel Corporation

At last check, Intel had more than 80 WLAN projects in various stages of implementation in the United States, Europe, and Asia. The company has been deploying WLANs primarily in warehouses, factories, corporate offices, sales offices and common areas.

And already Intel has reaped the rewards of global WLAN use. The numbers speak for themselves: an estimated productivity boost of 1.5 hours per day for each of the several thousand workers accessing roughly

80 wireless LANs in 18 countries. In response to the early success, Intel IT is now in the midst of a long-term deployment strategy designed to transition workers to access 802.11a WLANs that support a maximum data speed of 54Mbit/sec—with even greater security.

Asked to reflect on Intel's internal WLAN experience, Johnson is enthusiastic about Intel IT's successful deployment—that the group met its goal of securing anytime, anywhere computing for Intel's global workforce—and he's encouraged by the early, substantial returns from added mobility. "If I were asked by another IT manager whether to proceed with wireless LANs, my answer would be an emphatic *Yes!*" Johnson says. "The productivity gains we are seeing demonstrate that deploying wireless LANs to supplement our wired computing environment brings us a great deal of added value."

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RAY KURZWEIL

Founder, Chairman and CEO
Kurzweil Technologies Inc.

When Ray Kurzweil was 7, he discovered Tom Swift Jr., the boy wonder book series hero who was forever getting into perilous scrapes—and saving the day (often even the world) by retreating to his lab to invent something. It's no surprise, then, that Kurzweil grew up convinced that any problem can be solved if you simply apply yourself.

Kurzweil applied himself assiduously from an early age. At about 16, he built his own computer and programmed it to analyze music and compose new works in a similar style. He invented the first reading machine in 1975 after a blind seatmate on an airplane inspired the initial application of his omni-font optical character recognition technology. To build the reading machine, he also had to invent the Charge Coupled Device, or CCD, flat-bed scanner and text-to-speech synthesis—which he did in about a year. Pop singer Stevie Wonder was the first to purchase the reading

machine, and the resulting friendship between the two ultimately led Kurzweil to develop the Kurzweil 250, the first synthesizer to reproduce realistic piano and orchestral sounds. A slew of other inventions followed, including speech recognition technologies and pattern recognition algorithms that predict stock market performance. Author of the best-sellers *The Age of Intelligent Machines* and *The Age of Spiritual Machines*:



All He Has to Do Is Dream

Ray Kurzweil does most of his creative thinking in the lucid dream state, programming his brain to ponder a problem while he sleeps. Free from inhibitions, he often makes new connections while dreaming; when his powers of logic return upon awakening, he's visualized inventions, solved key problems and conceptualized book chapters. Using this technique, he has hit on a new way of doing virtual reality, for which he's filing a patent. We can only imagine what this means for Ramona, his virtual reality alter ego. (To meet Ramona, visit www.kurzweilai.net.)

When Computers Exceed Human Intelligence, Kurzweil, 54, is currently cowriting a book on reversing the aging process that summarizes the most current research on how to prevent a wide range of diseases.

"I really do think you can solve any problem if you put your mind to it," he says. "Most people don't take the time to think." Luckily for the rest of us, Kurzweil has. —Alice Dragoon

20/20 HONOREES KURZWEIL

PHOTO BY FURNALD/GRAY

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MIKE LAZARIDIS

Founder, President and Co-CEO
Research In Motion Ltd.

Mike Lazaridis needed a project to keep him busy when it was his turn to stay up watching his second baby. So Lazaridis, founder, president and co-CEO of Research In Motion (RIM), worked out a series of algorithms that determined ideal component placement for his entertainment system. The result is what colleagues describe as the "best home theater in the world," which Lazaridis—who also has an Oscar and an Emmy for inventing DigiSync, a special film tracking process—said he knew he got right when he "stopped tinkering with it."

The project didn't have the same world-changing potential as the one he took up when his first child was born. That was the BlackBerry—the pager-size device that revolutionized mobile communication. BlackBerry has 6.1 percent of the U.S. PDA market as of the second quarter, 2002, and is still the torch bearer when it comes to the delivery of wireless messages, according to IDC (a sister company to CIO's publisher). The BlackBerry breakthrough came at a crucial time for 41-year-old Lazaridis. Although companies had been implementing wireless projects for years, Lazaridis says, "it was a consulting industry not a product industry." A customer had to take products from tens to hundreds



Physics, the Root of All

If you want to get Mike Lazaridis talking, ask him about theoretical physics.

In 1999, Lazaridis founded the Perimeter Institute for Theoretical Physics at the University of Waterloo, hoping to pass on his love of the discipline to future generations. "If you look back through history, every industrial revolution has come from a breakthrough of theoretical physics," he says. Lazaridis thinks that the next revolution will come from the next wave of theories which, he says, could take 50 years.

of different companies and weave them into a custom solution.

Lazaridis predicted customers would need small, easy to use devices, and the industry needed a standard means of transmission. Lazaridis steered RIM, the only company he has ever worked full-time for, toward his vision. While the wireless war isn't over, the early battles have confirmed Lazaridis's instincts. Success hasn't crippled his drive to improve, however. While he thinks he has BlackBerry right, Lazaridis says, "I don't think I could ever stop tinkering with the BlackBerry."

—Ben Worthen

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SCOTT MCNEALY

Chairman, President and CEO
Sun Microsystems Inc.

When this reporter first heard Sun's slogan, "The network is the computer," I'm not sure I got it. Now everybody gets it. Over the years, Scott McNealy, 47, Sun's visionary and intemperate CEO, has said a lot of things—perhaps more hair-raising things than any other chief executive in the industry—garnering piles of publicity with his contrary opinions, prescient insights and very public jabs at Bill Gates and other rivals.

In 1982, McNealy started Sun (Stanford University Network) Microsystems at the age of 27 with three colleagues and \$15,000 borrowed from his father, then vice chairman of the now-extinct American Motors Corp. McNealy had attended Harvard, his father's alma mater, after scoring a perfect 800 on the math half of his SATs. He graduated in '76 with a degree in economics, then worked as a foreman at Rockwell International until he was accepted into the Stanford Business School in '78. After a brief stay at FMC, a manufacturer of armored

vehicles, and then at Onyx Systems, a micro-processor company (the sum total of his experience in high-tech), he started at Sun as the vice president of manufacturing. McNealy became CEO two years later.

By the early 1990s, McNealy had taken Sun from a pureplay workstation supplier to a server company and introduced Java, which weakened Microsoft's Internet dominance. Sun stormed into the high-end server market in '97, taking its market share in Unix servers from zero to 36 percent by 2000, an astonishing achievement for a

At the Top of His Game

Don't play golf against Scott McNealy for money. *Golf Digest* ranks him number one among CEO golfers, noting that he improved his already great game from a 3.3 handicap in 2000 to 0.3. When the first CEO rankings came out in 1998, McNealy challenged second-ranked Jack Welch, then-CEO of General Electric, to a 36-hole match. Welch won. McNealy was recruited to GE's board of directors shortly after. McNealy won the rematch.

company being sandwiched by Microsoft, IBM and Intel. Today, Sun is putting more emphasis on software, services and storage, a change meant to diversify the company's revenue to better withstand the sharply reduced corporate demand for high-priced servers. Anyone who wonders whether this will work should remember that McNealy, a hypercompetitive amateur hockey player and top-ranked golfer among CEOs, has been able to reinvent Sun many times and in the process provide us with some truly revolutionary technology. —Jerry Gregoire



TERESA H. MENG

Founder and CTO
Atheros Communications Inc.

Teresa Meng is an academic: a scientist with a bachelor's in electrical engineering from the National Taiwan University, a master's and PhD from Berkeley, an IEEE fellow who teaches at Stanford University and a National Science Foundation honoree who holds seven U.S. patents. So

what's she doing heading up a company in the heart of Silicon Valley? No one else would do it.

In the 1990s, Meng organized a group of students to work on low-cost, high-performance radio projects. By 1997, it was clear that one of those technologies—wireless applications in the 5GHz band—was mature enough to become a commercial product. But when Meng tried to sell corporate America, corporate America wasn't ready. "They all said it would take them five to 10 years to ramp up," she says. "We said, 'Well, we can do it in two.'"

In 1998 Meng launched Atheros Communications in Sunnyvale, Calif., now acknowledged as the leader in translating the 802.11a standard into practical, secure products. "If you believe in wireless," she says, "then [802.11a] is the only way to go."

Meng wants to keep the uncensored, 5GHz bandwidth free from the monopolies that have polarized the cellular marketplace. "I don't think governments have the right to sell bandwidth monopolies," says Meng, 41. "The air belongs to everybody."

Though Meng is clearly the technical and entrepreneurial star at Atheros, she was happy to take the title of CTO and leave the

executive leadership duties to CEO Rich Redelfs. Science aside, motivation is Meng's forte, says Bob Brodersen, founder of the Berkeley Wireless Research Center. "The first year," Brodersen recalls, "I think 80 percent of the employees were PhDs from Berkeley and Stanford. These people could have gone a lot of different places. She really pulled everybody in."

—Tracy Mayor

Straight Talk About Gender

What's it like for a woman in an overwhelmingly male-dominated field? Teresa Meng credits her father and the all-girls high school she attended in Taiwan with instilling in her a gender-blind confidence. But she's concerned that so few women—about 7 percent—pursue doctorates in the hard sciences.

When she decided in 1997 to start a company, Meng found some colleagues more condescending than others. "There are some males out there who still feel it's more important to make a woman feel comfortable than it is to get straight to the point," Meng observes. "It took me a while to learn that not all advice is good advice."



HASSO PLATTNER

Cochairman and Co-CEO
SAP AG

Larry Ellison, the alpha-engineer chairman of Oracle, drives Hasso Plattner, another alpha-engineer and co-CEO of arch rival SAP, crazy. So crazy, in fact, that Plattner has reportedly dropped his drawers and mooned Ellison not once but twice when the two have competed against each other in yachting races.

Though SAP has more than double Oracle's market share for ERP software, Ellison is a master marketer and that burns Plattner, whose company has been repeatedly criticized for lacking

says Marty Homlish, chief marketing officer for SAP. "The sense of responsibility [he] feels for the company is very strong."

Plattner also has prodigious amounts of energy and drive. "Hasso is pure, unbridled enthusiasm. Sort of kidlike enthusiasm," says Bruce Richardson, senior vice president of research at AMR Research in Boston. "You don't see that in a lot of billionaires."

These days Walldorf, Germany-based SAP has taken to following others into markets such as supply chain automation and CRM rather than blasting new ones wide open, as it did with ERP. Plattner, however, is unapologetic about his company's deliberate pace. "It's better to be a little late than too

Speed Comes Second

"As an engineer, you may ask why—when we come out with [a new product]—it has functionality but it is slow," said Hasso Plattner at this year's SAP user conference. "We cannot win with speed and lousy functionality. Nobody is buying that. It is necessary to have the functionality first. Then we can work on improving the performance. The good news is we have the engineering capability and foresight to make them fast, but I have to apologize that it always takes us time to achieve the performance you expect."

Mea culpas from billionaires don't come often, but 30 years after inventing ERP, Plattner still feels personally responsible for his software.

pizzazz. Plattner—who in 1972 invented ERP software and then sold it to the world so that today, almost without exception, it drives the globe's largest enterprises—takes everything personally. Company founders do that,

early if you have the stamina and the resources," he says. SAP clearly has plenty of both, but the question remains whether the 58-year-old Plattner has another ERP in him.

—Christopher Koch

DAVID SCHELL

President
OpenGIS Consortium Inc.

David Schell wouldn't call himself a technologist. He disdains bureaucracy. And he doesn't have patience for sales pitches. But in his role as president of the nonprofit OpenGIS Consortium (OGC)—founded in 1993—Schell continuously assembles technologists, bureaucrats and IT vendors to advance the cause of geographic information systems, the technology that tells us where things are. Schell wrangles more than 230 member-groups from government, industry and academia in more than 25 countries spanning four continents.

OGC's efforts have led to standard interfaces to describe geographic location coordinates and translate them into Web-ready code. One example: The British government's Ordnance Survey uses the Geographic Markup Language version of XML (developed by OGC) as its mapping standard.

Sit with Schell, 61, in his Wayland, Mass., office (42.3586 north latitude, 71.3587 west longitude, according to a GIS locator), and you'll see the self-confidence of a well-traveled, multifaceted individual who has studied both the Hebrew Bible and Egyptian hieroglyphics in the



Seeing Is Believing

"We live in a culture that's bewildering and that's being destroyed by too much information," David Schell says, when asked to explain why he believes geospatial information makes a positive difference in the world. Picture, for example, a map that shows climate changes or that tracks an air pollution plume. People can disagree about politics but not about what they can see. "Nothing is more humanizing than a holistic view of the world," he adds.

Middle East, served in the Air Force, attended Bob Dylan concerts, and programmed and serviced mainframes at IBM and Honeywell. In 1987, while customizing a workstation imaging app for NASA, Schell decided that making geographic information affordable, accessible and useful was a way to make a positive difference.

"The reason I was able to make progress," he says, "is that we fuse together the people who have the problems of mapping with the people who have the IT skills from the modern computer industry." OGC board members say Schell has also succeeded by putting technical experts, versus product partisans, in positions where they can drive industry standards.

—Michael Goldberg

GIL SHWED

Chairman and CEO

Check Point Software Technologies Ltd.

You can forgive Gil Shwed for not wanting to discuss his age, which he reluctantly confirms is 34. He was just shy of 25 when he and two colleagues started Check Point Software. The company's rise thrust Shwed into a spotlight most executives don't see for decades. His appearance on *Forbes'* 2002 list of under-35 "billionaire babies" has led some wags back home to call him the "Bill Gates of Israel."

All that attention comes thanks to Check Point FireWall-1, the first mass-market firewall that made its debut just as the Internet was taking off in 1993. That product and subsequent Check Point offerings are credited with helping define the nascent markets for network security and virtual private networks.

It was during Shwed's four years in the Israeli Defense Forces that he first had the idea for stateful inspection—the network security standard for which he holds a patent. Despite that, he shies away from suggestions that his nationality or military background are especially

significant to his business. "We look at ourselves as a technology company, not as a military company or as an Israeli company." Shwed sees Check Point, headquartered in Ramat Gan, Israel, and Redwood City, Calif., as a global company. "We have people all over the world with very different backgrounds and nationalities, but the most interesting thing to me is not how different we are from one another but how much we all have in common."

A Farewell to Coding

Gil Shwed cut his teeth as a programmer, but he no longer codes and he doesn't miss it. "There are smarter people here for that," he says. These days, Shwed thinks his greatest asset is his ability to integrate different disciplines. "My job now is to bring together the developers, the salespeople, the customers, the channel partners," he says. He even makes a direct connection between programming and customer care. "Right from the beginning," he says, "I tried to program from the customer's point of view."

He'll need all the teamwork he can muster in the times ahead, industry watchers say, to help Check Point fend off big competitors like Microsoft and Cisco Systems, and capture the more elusive consumer and wireless security markets. "My future, I hope, is to continue to figure out where we should be in six months and where we should be in three years. That's the really interesting thing."

—Tracy Mayor



THOMAS M. SIEBEL

Chairman and CEO

Siebel Systems Inc.

If Tom Siebel took a page from Dale Carnegie, his book on sales might be titled simply *How to Influence People*. Skip the making friends part. Siebel, the chairman, CEO and alpha dog at Siebel Systems, is well known and much admired, although not always

beloved. (And he has, in fact, written three books.)

Detractors and admirers alike say the 49-year-old is driven, demanding and competitive—a top-down manager who makes it clear, to the occasional consternation of his colleagues but to the delight of Wall Street, that business is business. One source who requested anonymity described him as "notoriously prickly."

"Tom Siebel will run a profitable business even in a nuclear winter," says Michael Maoz, a vice president and research director at Stamford, Conn.-based Gartner.

Love him or not, Siebel's management style has been good business for the San Mateo, Calif.-based company he founded in 1993 that defined and continues to dominate the market for customer relationship management software. Last year, *BusinessWeek*

named Siebel one of the top 25 managers, and a February 2002 report from Gartner concluded, "Siebel remains the only true leader in the [CRM] market." Siebel is indeed a visionary, Maoz says, but not in a technological sense. "Siebel Systems doesn't even have a research department," Maoz points out. "He's not claiming that they develop cutting-edge technology."

Instead, Siebel, both the man and the company, excel in that

commodity most precious to comedians and salespeople: timing. "Siebel's strength is identifying existing products that he feels have potential and then out-selling the competition," says Maoz. "His goal is not to be in advance of the market's ability to absorb new products. He's never too far ahead, and he's never, ever behind." And no one, fan or foe, doubts that when the dust settles, Tom Siebel will be standing tall.

—Tracy Mayor

Business Uncasual

If Tom Siebel's sales acumen sets him apart from the competition, his personal style distinguishes him sartorially. Siebel is famous for wearing a suit 24/7, and imposing a similar dress code on employees. Siebel's people reportedly asked Sun Microsystems' Scott McNealy, a notoriously relaxed kind of guy, to button down for a keynote he delivered at a Siebel user conference. He did. As more companies ditch the casual look, Siebel may come to be regarded as a fashion trend-setter.



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GREGORY STEPHANOPOULOS

Bayer Professor of Chemical Engineering and Biotechnology
MIT

He's a good professor," says Gregory Stephanopoulos's wife, Maria Flytzani-Stephanopoulos, who, like her husband, is a chemical engineer, though in a different area of specialization and at a different university, Tufts, down the road from Cambridge, Mass.-based MIT, where her husband teaches. "It is important to think and be creative, and he tries to instill that in his students. They're free to run and create."

That's probably because Stephanopoulos, 52, likes to do the same thing. He got creative when he saw how difficult it was for pharmaceutical companies to get a handle on antibiotic production. Biological compounds aren't predictable. You know how much steel goes into a Ford, but there are always wild variations in what emerges from the slurry of raw materials used to grow antibiotics. There are simply too many variables. And that meant uncertain supply for the pharmaceutical companies.

So in 1994 Stephanopoulos applied IT to the problem. Along with some of his grad students, he developed a data mining program, called Dbminer, which sifts the information kept about each batch of slurry for behavior patterns inside those dark tanks. The program makes it much easier to identify problems—or highlight things that work well—significantly reducing the unpredictability of the process. He also built a version of the program for some major pharmaceutical companies, such as Eli Lilly and Merck, and is in the process of examining commercial versions of the software to sell to other companies.

It's a lot more complicated than sifting through cash register receipts to discover that men buy diapers and beer at the same time on Thursdays, but the mathematical underpinnings of his solution are widely applicable and could produce drastic increases in speed in everything from medical diagnostics to drug research.

—Christopher Koch



Life's Secrets, Revealed

Gregory Stephanopoulos gets excited when he talks about data mining's potential to bring the biological sciences to a new level:

"Doctors will soon be able to measure the expression of 40,000 different genes when you go get a checkup.

"Right now, we have no idea why one person lives to be 100 and why another dies at 45 of breast cancer. In 20 years, doctors will be able to look at the genetic movies of thousands of people's lives, and there will be tremendous insight into the reason some people live long, healthy lives and others don't."



MATTHEW SZULIK

Chairman, President and CEO
Red Hat Inc.

Imagine if Revolutionary War instigator Thomas Paine had needed to answer to Wall Street, and you start to appreciate Matthew Szulik.

Szulik, 45, has two diametrically opposed duties. He must

source] community but at the same time being a decisive businessman," says Young.

Szulik has taken it even further than balancing the contradictions; he seems to have integrated them. He has transformed the open-source cause into marketing. Once merely an alternative operating system for college students and computer-literate Microsoft Windows haters, Linux

A Passion for Open Source

Matthew Szulik had spent 14 years in sales and marketing positions at various high-tech companies before becoming president at Relativity Technologies in the late 1990s. Staying there would have been the safe route, but the passion for open source displayed by Red Hat founder Bob Young sufficiently moved Szulik to lure him away from traditional software business. Ultimately, Szulik signed on because, as he says, "I just believed in the process."

promote the open-source movement—the concept of distributing computer code without copyright restrictions—with what he calls his "social responsibility." But Szulik must also move his publicly held company to compete in the ultrapractical Darwinist business world, what Wall Street would call his "shareholder responsibility."

Few people can master both tasks, and even fewer can balance them the way Szulik does, which is why Bob Young, Red Hat's cofounder, handed his Raleigh, N.C.-based company to Szulik. "You need that odd combination of listening to the [open-

now has become a less expensive OS option that gives users more control.

Despite the necessary forays into the cynical world of marketing against the most powerful technology companies in the world, Szulik says he's optimistic that in his lifetime, the open-source model will come to dominate the software business. "It's a goal of mine to have our brand become the defining technology of the 21st century," he says in a moment of pragmatic idealism. "And to have our brand stand for something different than the goofiness we've seen for the past 10 years."

—Scott Berinato

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TECHNOLOGY NEEDS TO CHANGE US

FUTURIST **ESTHER DYSON** TELLS *C/O* WHAT GIVES IDEAS STAYING POWER

Companies, industries and the world are continuously remade by technology.

A technology that could transform the way your company operates—or put your company out of business—may be in development right now. Yet of the multitudes of products, processes and patents generated each year, only a few have a real impact. Even fewer have a lasting impact. The 20 people honored here for technology development have been chosen because they have the rare ability to develop truly innovative, significant and enduring technologies. But what factors give some technologies staying power, while others come and go? We put the question to Esther Dyson—technology pundit, investor, conference organizer, and all-around mover and shaker. In the quarter century that she has been following technology development, Dyson has developed a theory: Only those technologies with the power to

change society are here for the long term; those without that power will soon be gone.

That's a tall order, one that most technology developers are unable to meet. Many of the dotcom technologies—hyped as breakthroughs—turned out to be superficial improvements over traditional business products and processes, Dyson says. Consequently, they were unsustainable once the speculative bubble burst.

In contrast, Dyson says, the more utilitarian a technology, the more significant its innovation. "What makes technologies last is that same old boring thing: They do something useful," she says. For example, "HTML works everywhere. SQL databases are a miracle of modern man." Dyson believes that both will be around for a while.

BY EDWARD BREWITT | PHOTOGRAPH BY EVAN KATKA

Dyson is quick to add that utility is not the only test of a technology's promise. Even the most promising technologies can be relegated to obscurity by a bad business model. Consider how different the state of personal computing might be had Apple sooner shared the Macintosh source code, as Microsoft did with DOS and Windows. "You could say that the Macintosh, which is arguably a superior technology [to Wintel PCs], didn't find the right business model," Dyson says. Conceivably, the right business model could have propelled the Mac to a dominant market share for desktops, rather than the also-ran shelf it now occupies.

Significant technologies are not always a slam dunk either, says Dyson. She has seen some technological concepts stumble

The container of Windows can hold just about anything, and therefore it allows users to do everything. The "interoperability and broad accessibility" of Windows is the main reason why Microsoft has attained its current market position, in Dyson's view, as well as the reason Gates deserves his place as one of the 20/20 honorees.

Of course, business and social contexts change, often as a consequence of new technologies. In fact, Dyson believes that a technology's significance can be judged by how much it changes our behavior. E-mail is the obvious example: The technology lacked significance until it reached a critical mass of usage. A change in how people communicate made e-mail the ultimate killer app. Dyson also notes that that critical mass didn't come together all by

Tim Berners-Lee's lead role in development of the Web now underlies much of the ongoing activity in collaborative computing.

Even in today's market, Dyson remains an active investor in technology companies, with more than 40 currently in her portfolio. In pursuing her personal mantra of "discovering the inevitable and promoting the possible," Dyson puts money into technologies and companies that create new usefulness and value. She believes that one promising area is identity management. Dyson sees the need for technologies that will enable people to control their online identities and allow companies to verify consumers' identities.

Another promising technology is wireless. Dyson predicts that the technology will boom as telecommunications companies

Dyson has seen some technological concepts stumble through infancy, but she believes that if they create sufficient value, they will take hold.

through infancy, but she believes that if they manage to create sufficient value and usefulness, they will eventually take hold. Form will follow function. "Usually, if the technology is good enough, you'll have a business model to support it," she says. "Maybe not the first try or the second, but eventually someone will get it right." She cites the history of desktop computing, which is studded with obsolete nameplates that failed to catch on with consumers until IBM and a young entrepreneur named Bill Gates established a market standard. In a similar fashion, another 20/20 Vision Award honoree, Thomas Siebel, leapfrogged other entrants in the nascent CRM market and developed the leading version of CRM technology, thereby setting the stage for the enormous expansion of that market in recent years.

So, says Dyson, utility is what really counts—but what creates utility? The value of Windows is not embedded in the OS; the value exists in the business and social context. "It's the standardization of Windows that has made it so useful," she says. "It's a container, not just an operating system."

itself. E-mail would never have spread as quickly had the operators of independent networks such as MCI and CompuServe not committed to the Internet standard of the late 1980s.

Looking forward, Dyson sees two areas where that kind of standard-setting is badly needed. One is instant messaging, which will be of limited usefulness to businesses until IM vendors are able to settle on a common protocol and security standards. The other is the domain naming system for all Internet sites, whose rationale has been the subject of dispute for years. For Dyson, standardization is one of the requirements of successful technologies. Much of the value in technology, she says, is fundamentally about standardization. "Is [a technology] capable of talking to other systems?" asks Dyson. "The level of abstraction rises and rises."

Successful standardization and increased abstraction mark the achievements of many of this year's 20/20 honorees. Dyson says of Vinton Cerf: "Putting AOL, Prodigy and the Internet all together is as much his work as anyone." And

use it to bridge the gap between broadband gateways and users' homes and businesses—the so-called last mile. Location-based computing, which combines triangulation technologies and global positioning systems, could also be a boon to wireless. There are, in this case, social implications to be sorted out, as companies could track their consumers' whereabouts and activities. "They know where you are, and not everyone likes that," she says.

But social implications are, after all, a requirement of lasting technologies. "Technologies with staying power have social implications and business implications," Dyson says. "If they didn't, they wouldn't matter. Business is about people, about people interacting." Just ask any of this year's 20/20 honorees. **CIO**

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WHO MADE IT
HAPPENC/O MAGAZINE HONORS THESE 20 IT PRACTITIONERS
AND BUSINESS LEADERS

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Executive Vice President
and CIO
CIGNA CORP.

JEFF BEZOS
Founder, Chairman and
CEO
AMAZON.COM INC.

JOHN BOUSHY
CIO and Senior Vice
President of Operations,
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Group Vice President
and CIO
GENERAL MOTORS
CORP.

KEVIN TURNER
President and CEO
Sam's Club (division of
Wal-Mart Stores Inc.)

MEG WHITMAN
President and CEO
EBAY INC.

ANDREA ANANIA

Executive Vice President and CIO
Cigna Corp.

Talk about not pulling any punches. After being named Cigna's corporate CIO in 1998, Andrea Anania addressed the more than 3,000 employees whom she would now lead, saying, "You are probably all wondering, Am I a good witch or a bad witch?" A slide of Glinda the Good Witch and the Wicked Witch of the West underscored her point.

"Those who have worked with me know I can be a tough customer," she continued, as the snickers in the audience died down. "That's because Cigna's customers are tough, and I want to address their needs. When we meet and exceed our customers' expectations, I am Glinda the Good. If we don't, you don't want to know."

It was a worthy opening for a woman who would soon transform the health-care giant's fragmented IT organization into a lean, cohesive unit. Instead of yellow bricks, the road to this Oz would be paved with resistant employees and an entrenched bureaucracy. She would abolish structural barriers among IT staff and

create a community split into five IT specialist "practices." She believed the structure would help IT deliver more efficient enterprise solutions internally while enabling customer-facing products externally. None of that would occur overnight. "This was a three-year strategy. We had to communicate very clearly that this was not a strategy du jour," says Anania, 49.

Her boss, Chairman and CEO H. Edward Hanway, began looking for the new generation of IT projects. He was not disappointed. Last year, Cigna, based in Philadelphia, gave its consumers full access to their accounts online. This

Definitely Not a Geek

She has toiled in IT for 25 years, but don't call Andrea Anania a geek. Anania earned her place in the executive suite. With her Wharton School MBA, she has always prided herself on understanding the business. "I started out as a programmer," she says, "but I've had sales assignments, marketing assignments and project management assignments. I don't consider myself a technologist at all."

summer, Anania's group took that one step further with the rollout of MyCigna.com, a free, personalized Web portal for the company's 16 million health and retirement plan users.

Anania's biggest contribution at Cigna, she says, has been the ability to see drastic changes that needed to be made before IT could deliver responsive solutions. "I can take a step back from the day-to-day and think about how things need to be done a few years out," she muses. Anania can still take a hard line when she needs to, but for now it's Good Witch all the way. —Lauren Gibbons Paul



JEFF BEZOS

Founder, Chairman and CEO
Amazon.com Inc.

Skepticism is healthy," says Amazon.com founder Jeff Bezos. "The abnormal thing was the year 1999 when all the skepticism got really quiet. Skepticism is the traditional role of investors. It's the traditional role of the media. It's a very healthy phenomenon."

As one who's confronted more

skepticism than any other Internet-era entrepreneur, Bezos ought to be an expert on the matter.

And if all the skepticism—about his business plan, about Amazon's ability to generate profits, about his leadership skills—has had any effect on 1999's *Time* Magazine Person of the Year, it has been to focus him all the more on proving his detractors wrong.

His business remains today's biggest Internet pureplay. It is the company that popularized the notion that profits are overrated, growth is to be pursued at all costs, and the customer is king. And even though he's watched Amazon's \$100-a-share stock stumble—and then tumble—Bezos has stood his strategic course.

What buoys Bezos, 38, is his unwavering belief in Seattle-based Amazon.com and the long-term vision he embraces for it—an

enterprise that has forever changed the face of retailing.

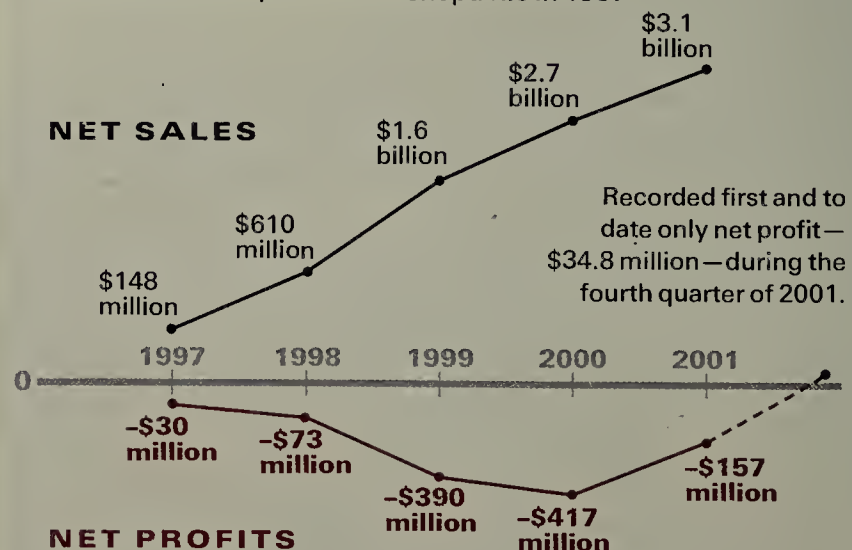
"If there's a particular flavor we've added to the mix," Bezos says, "it's that we're so obsessed over the customer experience; we take that into everything we do."

But more than anything else,

what he says has motivated him during tough times is that others are relying on him: his employees, his investors, and the customers who first made Amazon a cult and then proved that after all is said and done, a store without walls is a good idea. —Meridith Levinson

Losses and Profits

Founded in 1994, Amazon went public in 1997





JOHN BOUSHY

CIO and Senior Vice President of Operations, Products and Services
Harrah's Entertainment Inc.

BM and AT&T told him it couldn't be done. John Boushy, then senior vice president of IT and marketing services at Harrah's Entertainment, wanted to connect multiple AS/400 mainframes to a Unix database—a feat that had never before been accomplished. But Boushy and Harrah's CEO, Phil Satre, were undaunted. In 1993, an era when most casinos were luring customers with fountains and volcanoes, they were determined to build a single, integrated customer database that would enable the first national recognition and rewards system in the casino industry.

The task would require a mammoth multiyear integration effort to connect transactional AS/400 mainframes at some 20 Harrah's properties to a single Unix-based database. Armed with a vision of a customer-centric business, Boushy rallied his IT staff by emphasizing the end goal and reminding them often of the little engine that could. Under his leadership, the Harrah's IT team would accomplish the seemingly impossible.

Three years into the project—and three months before the scheduled completion date—Boushy pledged not to cut his hair until the system was up and running. Two months later, a database error wiped out the entire 300GB database, and a bug in the backup software rendered the backup tape useless. The team had to start from scratch the six-month process of reloading data. The day after the database, dubbed WINet, went live in February 1997, Boushy let everyone who'd worked on the project snip a lock of his hair. "It was the rattiest-looking haircut," says Boushy, 48, who had just enough time to get it cleaned up before the next board meeting.

Today, WINet puts the company in what Boushy, now CIO, estimates is the top 5 percent of CRM practitioners, enabling a sophisticated revenue management system that calculates the expected profitability of individual customers on the fly.

"Most competitors emphasize hardware—restaurants, hotel rooms and fountains," says Satre. "While those are all important, underlying everything we do is how does it fit into our software? John was critical in architecting that software." —*Alice Dragoon*

He Danced 'til a Quarter-to-Three

Harrah's CIO John Boushy briefly dropped out of college to play keyboards in a rock band with Gary U.S. Bonds. At that stage of his career, Boushy's hair reached halfway down his back.

CLAUDE CARGOU

Chief Auditor and Former Group CIO
AXA Group

In 1975, Claude Cargou, then a systems engineer fresh out of school, now the former group CIO and current chief auditor of Paris-based AXA, the world's third largest insurance company, bought his first adding machine. It was built in 1820, is 60 centimeters long, 10 centimeters high and 10 centimeters wide, made of oak, coated in gold, and has buttons to slide for calculations. Since then his collection has grown to more than 100, and he hopes to convert an old building he bought in Brittany into a museum for them.

When you listen to Cargou, 54, describe the machines, you can easily understand why he became a CIO. "I found it interesting that we could transform a concept into a reality," he says. "I found it interesting that you could do something highly theoretical that could then provide a service for people. This machine has those characteristics. It works all the time, it delivers what we expect, and it is easy to use."

Those are the same qualities that Cargou expects of the systems he designed and built for AXA. Through experiences that still make him cringe, he learned that the value of a system lies not in its design but in



Saving France

This year, Claude Cargou was awarded the French Legion d'Honneur Award for his efforts as unofficial French minister of Y2K.

As early as 1995, Cargou was warning his colleagues that "we are facing a difficult situation and...we have to solve it."

Cargou therefore became a one-man campaign for Y2K compliance. He opened AXA's books and developed databases full of best practices, which became the country's Y2K road map.

its use. By crafting easy-to-use systems, he has made both a name for himself—he was the head of CIGREF, the French association of CIOs—and a home. He was the CIO at AXA for more than 11 years, and when he left that job earlier this year, he stayed with the company as the chief auditor. He has no plans to leave. "I have always been loyal to my company and always loyal to my boss," he says, even when it means putting the "interests of the company first and my interest second." What else would you expect from a man who says his first adding machine is still his favorite?

--Ben Worthen

ROBERT B. CARTER

Executive Vice President and CIO
FedEx Corp.

You might have expected Rob Carter to join the military. Born in Taiwan in 1960, Carter was an Air Force brat. By 15, he had spent more of his life abroad than he had in the United States.

But by the time he hit high school, he knew the military was not for him. "I lost interest in being a freshman plebe at an academy," says Carter, now 42. "You know, run everywhere and eat square. I dunno, maybe I was a bit of a rebel."

Instead, he went on to study business. But one piece of his military background never left him: his worldview and the exposure to different countries and cultures. It serves him well now that his company, Memphis, Tenn.-based FedEx, where he's been CIO since June 2000, is successfully expanding its reach to become the world's preferred logistics provider.

"American companies tend to be very ethnocentric, and frankly it's very different in other parts of the world," says Carter. "We have to have a broad awareness of that in order to be a globally effective company. That's true for IT as well. We implement technology all over the world with people *from* all over the world."

To that end, Carter practices (and preaches) the discipline of alignment. "There's no stronger criteria for good implementation," he says, "than having a great team from both the technology and the business side working together to make something happen."

—Christopher Koch



True Believer

FedEx's biggest growth is coming through the Internet, says CIO Robert Carter. FedEx.com may seem like old news, but it is still changing and adding new functions. "It is our fastest growing channel for package delivery growth, for customer service, for high-volume transactions from big shippers, you name it," he says. Revenue generating applications such as online billing and bill pay are also helping the website grow at triple-digit rates.

Indeed, the hype about the Internet may be over, but you wouldn't know it to hear Carter. "The richness of Internet applications are in their infancy now," he says. "Just like the lightbulb created the utility network that we have today, business and business process and the deep relationships that customers and suppliers have will all be implicit on the worldwide public network, and that will be how companies make money."



FRANK FAIRBANKS

City Manager
City of Phoenix

Frank Fairbanks has become an IT leader by getting out of the way. It's a skill he learned from his mentor, former Phoenix City Manager Marvin Andrews. "He could never figure out how to use a computer," says Fairbanks, "but he was so supportive of innovation, he

encouraged me to take the lead."

Fairbanks, 56, a Phoenix native, has been city manager for 12 years. During that time, the city has earned numerous management accolades, including best run city in the world in 1993, according to the Bertelsmann Foundation, due in part to the way the city agencies use technology to manage their performance and deliver services. Among Fairbanks's coups have been outsourcing most systems development to contractors who can afford to hire better technical talent, and improving business-IS alignment by periodically changing which of five deputy city managers his CIO reports to. The strategy has paid off. "If I had to say the thing I'm most proud about, it's that people are excited about information technology and they feel authorized to try to develop projects," says Fairbanks.

Costis Torgas, president of Pub-

lic Technology, a Washington, D.C.-based technology think tank for local governments, has known Fairbanks for 25 years. Fairbanks was never "an IT nut," Torgas says, but always understood that technology was a tool that could help him accomplish his service delivery goals—unusual for government leaders at any level until recently.

Although Fairbanks has concentrated on building systems to

improve the city's internal operations, projects to enable citizens to transact business with the city have lagged. "It's a huge handicap," he admits. Phoenix will begin to address the gap this year with some online bill payment services and is developing a system that will let developers file blueprints and apply for building permits electronically.

—Elana Varon

How Paying Bills Can Save Lives

In the late 1960s, Frank Fairbanks joined the Peace Corps. Sent to Costa Rica, he saw children dying of dysentery. While there, he helped demonstrate that if local water departments improved their service, people would pay.

"The realization that what I did could improve the quality of life for people was a big turning point," says Fairbanks. When his tour was over, he returned to his native Phoenix and got an entry-level job in 1972 as a management assistant with the city government. He's served the public ever since.

JOHN GLASER

Vice President and CIO
Partners HealthCare System

Everybody goes to the doctor," says Partners HealthCare System CIO John Glaser, describing why he was drawn to medical information technology. But if you're the new CIO of your state's largest hospital group, you might want to be careful when you do. In late October 1988, shortly after starting at Brigham and Women's Hospital (one of the hospitals that formed Boston-based Partners in 1994), Glaser got a splinter in his ring finger. By Halloween night it had turned purple, so Glaser went to the hospital. When he told the attending physician, John Teich, who he was, Glaser—who doesn't shy away from colorful language—says the doctor "told me my systems sucked." To Teich's surprise, four days later he got an office on Glaser's floor and became corporate director for clinical systems research and development.

Since then, Glaser, 47, and his

team have developed a computerized order entry system that automatically checks for serious medication errors and has reduced them by 55 percent. The improvements to patient care and administrative efficiency are so staggering that the order entry system is now being commercially developed and is eagerly anticipated by other health-care CIOs who believe that it is the next wave of hospital systems. Glaser and his teams have since developed an emergency room tracking system and computerized medical records and medical imaging systems. "I can't make a doctor be 100 percent accurate, but we can give them the tools," says Glaser, who has also written a children's book.

Sam Thier, the Partners CEO, says Glaser "could literally do anything." Such respect is not an unusual reaction when colleagues and friends talk about the man many feel has accomplished more than anyone else in medical information technology.

—Ben Worthen

Star Student

In 1977 John Glaser was working as a Fortran programmer for the "National Medical Care Expenditure Survey." He was fascinated by the results of the survey, and soon he was a graduate student at the University of Minnesota's health informatics program, equipped with what Lael Gatewood, Glaser's former doctoral adviser, calls "a vision" for how to use computers to support clinical information systems."

Glaser was a determined student. He graduated in record time and was still able to write a 476-page dissertation.



DAVID KEPLER

Corporate Vice President and CIO
Dow Chemical Co.

Dave Kepler is a practical risk taker. That's not an oxymoron. It's a guiding principle. In 27 years at Dow, the 49-year-old CIO has pioneered cutting-edge technologies, making Dow a leading user of IT, and that experience has taught him the difference between smart risks and foolish choices. "If you can understand what the issues are and be pragmatic when approaching something," he says, "I think you know how to pick the right things."

Under Kepler's direction in the mid-1990s, Midland, Mich.-based Dow was one of the first companies to successfully install an ERP system. Since becoming CIO in 1998, Kepler has driven Dow's investment in Elemica, a B2B electronic marketplace, and been an early adopter of voice-over-IP technology to carry Dow's telephone and data services.

Soul Man

In a black hat and sunglasses, David Kepler bears a passing resemblance to Ellwood Blues, Dan Aykroyd's half of *Saturday Night Live's* Blues Brothers. Enough, anyway, to ham it up as Ellwood for 200 employees at Dow's 1997 United Way campaign kickoff. Kepler, Dow's CIO, and an IS colleague reprised the gig twice.

"The key for me was to find a few good performers in our department to make me look good," jokes Kepler. "Maybe this is the secret to a lot of my efforts!"

Kepler has also made some unconventional decisions to stick with legacy systems—notably migrating Union Carbide back to an old version of SAP after its merger with Dow. "His strategy around that is crystal clear," says Stewart McCutcheon, CTO with Elemica. "He's made his investment in ERP, and upgrading isn't going to buy him much."

From age 12 through his early 20s, Kepler worked in his father and uncle's hardware store in his hometown of Pleasant Hill, Calif. There, he picked up three pieces of wisdom: First, success depends on your relationship with your customers; second, cash flow is critical; and third, "spend money as if it's your own because it is," Kepler says. At the University of California in nearby Berkeley, he'd planned to become an oceanographer but "got into chemistry" and graduated with a degree in chemical engineering. "Computers were being used [for] controlling plants, and that got me into the broader IT area," he says.

—Elana Varon



KEN LACY

CIO

United Parcel Service of America Inc.

Ken Lacy began his career at UPS in 1967, taking in packages and sweeping the floors as an 18-year-old clerk in the Orlando office. At 26, he became one of the youngest district controllers in the company's history. After working his way through college—and the finance and accounting ranks at UPS—Lacy became corporate controller in 1992. "I thought I had arrived at that point and would be there a long time, safe and sound in that job," he recalls. Lacy was wrong.

In 1994, after Lacy successfully managed the automation of UPS's finance and accounting systems, then-CIO Frank Erbrick asked him to trade in his bean-counter's visor for a propeller hat. Lacy agreed to make the leap and became operations manager for IT in New Jersey, the site of one of UPS's two huge data centers. In September 1996, he took over the CIO reins upon Erbrick's retirement. Today the 53-year-old Lacy presides over an annual IT budget averaging \$1 billion and sits on UPS's management committee.

Lacy played a key role in shifting much of UPS's business online. "UPS had tracking and order entry in the very early '90s," Erbrick says. "Ken was very instrumental in that." Under Lacy's watch, the Atlanta-based company has developed an IT infrastructure that makes it possible for UPS to capture data electronically on 90 percent of the 13.6 million packages it ships daily. Each time a package is scanned in transit, data from its smart label is



Truckloads of IT

Ken Lacy presides over an annual IT budget that averages \$1 billion. The \$15 billion that UPS has spent on IT in the past two decades is more than the company has spent on its trucks.

uploaded to a gargantuan DB2 database, enabling customers to track the status of their packages online or on the phone around the clock.

Having "grown up" (as he puts it) on manual systems and lived through their computerization, Lacy is keenly aware of the business drivers behind his IT strategy—and knows how to build a winning team to execute it. "Any job you have, you have to manage it like your own business," says Lacy. Accountability and respect also figure prominently in his management style. "You've got to be a team player and treat your people with respect because they're the ones who really do the job," he says.

Erbrick calls Lacy a superb manager and affirms that he is the ultimate team player. "He works hard and is always willing to admit when he doesn't understand," says Lacy's former boss. "Ken builds harmony like few people can. And he truly knows the business." —Alice Dragon



DAWN LEPORE

Vice Chairman of Technology, Operations and Administration
The Charles Schwab Corp.

Dawn Lepore's savvy has not gone unnoticed in the Charles Schwab executive circle. Last December, co-CEOs Charles Schwab and David Pottruck expanded Lepore's role, adding operations and administration to her already considerable responsi-

bilities. As vice chairman, Lepore took on the added duties with her trademark gusto, despite equally momentous responsibilities at home. Lepore has a 6-month-old baby girl as well as a 4-year-old son. It's enough to make anyone's head spin, but if anyone can do it all, Dawn Lepore can.

After 19 years at Schwab, she has an innate understanding of the company's mission, which she helped develop, and the direction of the industry. "I think Schwab has several times over helped shape the financial services industry," says Lepore, 48, from her office in San Francisco. "It's very exciting. That's the reason I come to work every day."

Lepore has been there through it all—through Schwab's industry-first introduction of a no-load mutual fund, its debut of a comprehensive customer extranet and

its development of expanded advice options for investors. "I do feel very proud of the role I've played in all of this," she says.

She attributes her success to a willingness to take risks. When colleagues at other companies questioned the Schwab decision to invest heavily in Web training in 1995, Lepore was surprised at their reaction. "I always felt the Internet

was here to stay. I was willing to take a calculated risk, as long as it would help our clients," she says.

Lepore admits she's good at seeing the big picture. "But I don't wake up and say, I'm a visionary," she says. "Sometimes I can't believe the path I've taken through this company. I do have to stop and pinch myself sometimes."

—Lauren Gibbons Paul

The Road Not Taken

If they hadn't heard already, Dawn Lepore's Smith College colleagues might be amused to learn of her high-powered business career. Lepore was a classical music major at Smith—piano was her instrument.

But Lepore feels her current role hasn't brought her too far afield from the early days. "It's all about dealing with people, synthesizing information and getting results," she says. Who knows, she may one day be renowned for her musical talents. She plans to return to the piano when and if she can muster a little spare time.

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DAWN MEYERRIECKS

CTO

U.S. Defense Information Systems Agency

Dawn Meyerriecks brings a six-pack of Diet Coke to work in the morning, but she doesn't seem to need it. Her energy resonates over the telephone before she's popped open the first can. "I have the best job in the world," Meyerriecks says.

She relishes meetings with the nation's best technical minds—part of her job as the top IT strategist for the Arlington, Va.-based Defense Information Systems Agency, the military's in-house integrators. But Meyerriecks is equally proud of her colleagues. On Sept. 11, Meyerriecks was out of town on business. When she contacted her staff, they told her, "We're all over this. Figure out how you're going to get home," she recounts. "As a leader you think this is exactly how it should work."

Meyerriecks knows how to get top leaders from the Army, Navy and Air Force to stop squabbling and agree to a shared technical vision. Before she became CTO in 1999, Meyerriecks was in charge of defining a common operating environment for the military's command and control systems. It required team buy-in. Troops fighting in Afghanistan last year, including Meyerriecks' brother, an Air Force pilot, got the payoff when they were able to more easily share data about the location and movement of enemy targets.

As a girl in rural Trafford, Penn., Meyerriecks thought she would be a professional musician but decided to major in electrical engineering at Carnegie Mellon University. Military service appealed to her, but she didn't think to enlist. "Where I grew up, it's something women didn't do," says the 43-year-old.

Meyerriecks worked on defense projects at the National Aeronautics and Space Administration's Jet Propulsion Laboratory in California. In 1993, she moved to Virginia for a detail at the Army's Global Command and Control Office and decided to resettle there. "My family was all here," she says. "I had two small kids, and they were going to grow up without knowing who their aunts or uncles were."

—Elana Varon

An Even Strain

Dawn Meyerriecks models her leadership style on that of her predecessor, former Technical Director Frank Perry, who is now CTO with the Department of Veterans Affairs. Perry, she says, is unflappable, and he never lets naysayers get the upper hand. "I [learned] don't ever let anybody know they're getting to you," she says. "If you can maintain calm when everyone around you is angry or frightened, they will look to you."



NIGEL W. MORRIS

Cofounder, President and COO
Capital One Financial Corp.

Companies have been doing market research for decades, but Capital One Financial does it more scientifically. For example, in 1999 Nigel Morris (who cofounded Capital One and became its COO in 1994) offered credit cards to two small, similar groups of customers. The differentiator was the channel: One group signed up on the Internet

least 65,000 times.

Data mining is at the core of those experiments. Even slight changes to the many variables that alter credit users' behavior can affect the bottom line. Technology lets Morris slice up the rewards—and the audiences that receive them—into ever finer segments. By identifying groups not being served by the credit card industry, he and his cofounder, CEO Rich Fairbank, opened up new markets by pioneering credit cards for high-risk customers—customized to minimize those

There'll Always Be an England

Nigel Morris, who studied psychology in England, hasn't lost his scientific focus. "Many companies have tried to duplicate what we do but it requires a sophisticated understanding of these kinds of test-and-learn frameworks," he says. "If it's not part of their academic training, they have a hard time getting them to work."

Morris hasn't changed in other ways. "He's steadfastly maintained his Britishness," says Capital One CEO Rich Fairbank. "He still opens up the boot of his car and gets petrol."

and one offline. The results?

"Internet people are substantially more risky," says the 43-year-old Morris, whose background in psychology has left him with a great appreciation for the scientific method. "There's a much higher preponderance of fraud, and they are much more likely to leave you for another company. So the Internet is a much more difficult channel to make work in the credit card business." Morris claims Capital One has run tests like these at

risks. (The Federal Reserve recently has expressed reservations about the Falls Church, Va.-based company's ability to avoid those risks, and the company has suffered some market reversals.)

It's Morris's skill in building an experimental machine that integrates rigorous scientific analysis with a risk-taking culture that has powered Capital One's prodigious growth during the past seven years, and also makes him one of the 20/20's most successful IT implementers. —Christopher Koch



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MICHAEL PRINCE

Vice President and CIO
Burlington Coat Factory Warehouse Corp.

He doesn't play blackjack. And you'll never see him feeding coins into a slot machine. Yet many would consider Michael Prince, CIO of the Burlington Coat Factory Warehouse, a gambler because of the bets he's placed on unproven technologies during the course of his 19 years at the Burlington, N.J.-based discount apparel retailer. Almost without exception, those bets have paid off in phenomenal year-over-year growth. "Gambler," however, is a moniker Prince, 61, rejects.

"We just don't gamble," he says. "Every one of the technology decisions we've made—and that people often associate with being leading edge or high risk—have proven to be mainstream within two to three years after we've adopted them."

Prince has bet (his word) on a wide range of unconventional technologies that have since become, in part due to his success with them, industry standards. In the mid-1980s, he began running Unix, at that time embraced primarily by scientists and grad students. He bought relational databases and installed a TCP/IP network when everyone else was beholden to Novell. When the rest of the world was using dial-up, he



Wild Life

Once, during a vacation in Australia, Michael Prince, his wife and one of his three sons went for a bike ride in the outback. Prince had pulled ahead when he heard barking behind him. Imagining a pack of wild, snarling, ravenous dingos, he tried to get away, but the hounds kept gaining on him. Just when he thought he was a goner, a pickup barreled past carrying a bunch of barking dogs in back.

"I was running away from a truck," Prince says. "To this day, my wife and son tease me about it."

installed a satellite network. He began using storage area networks in 1998, and today he's achieved a measure of notoriety for his support of the Linux operating system, which he began deploying back in 2000.

To mitigate risk, Prince says he "tests the hell" out of these products. And when he finally gives a technology the green light, he deploys it in phases and doesn't run it in mission-critical environments until he's sure it's ready.

Even in the recent economic downturn, Prince is still placing bets. "We need world-class computing, and we need to keep our IT costs under 1 percent of our sales," he explains. "You can't do that unless you're innovating."

—Meridith Levinson



STEPHANIE REEL

Vice Provost/Vice President and CIO
Johns Hopkins Medical Center and University

Back in 1980 Stephanie Reel, a Baltimore area mother of two, was back in school getting an MBA. As her job as a data processor for the Maryland court system became more IT focused—and consequently more interesting—Reel decided to pursue a career in information management. One night as she walked her

dog, she ran into Wyatt Medicus, a neighbor who was the CFO for the North Arundel hospital. Soon Reel was the hospital's CIO. Twelve years ago, her interest in health-care IT firmly entrenched, she then jumped to Johns Hopkins Medical School, her self-described dream job at the institution that casts a long shadow over the city where she was born and raised.

Reel, 50, says that being a health-care CIO is a different challenge from any other industry. Most companies, she says, "think about technology to reduce cost. We think about how do we keep people healthy and allow them to make more informed decisions." The accomplishment for which Reel is best known, Hopkins' electronic patient record system, does just that, giving health providers access to every detail about a patient—including test results, physician notes and radiological images—and is device independent. The

system was widely recognized as the most advanced of its kind and has won numerous medical and IT awards.

Ronald Peterson, president of the Johns Hopkins health system and hospital, says that his CIO has great communication skills and calls her "a consummate politician." Reel laughs and says that she basically just told the new doctors and residents that they should use the system, adding, "Doctors have an intense desire to do their jobs better." So does this CIO.

—Ben Worthen

Double the Fun

In 1999, Johns Hopkins University was looking for a CIO. Stephanie Reel sat on the search committee. As the search for a qualified candidate dragged on, Reel's competitive juices started to flow. "I kept thinking I could do that," she says.

Reel tries to keep the two jobs of CIO and vice president separate. It also means two sets of business cards, two e-mail addresses and even two wardrobes—pants for the university, skirts for the hospital.

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GARY REINER

Senior Vice President and CIO
General Electric Co.

Former General Electric CEO Jack Welch may have coined the term *digitization* and exhorted the company's top managers to replace paper and manual processes with electronics and automation, but Gary Reiner, GE's senior vice president and CIO since 1996, has been the person in charge of supplying those managers with the systems and tools to make that vision a reality.

Welch sold digitization by characterizing it as going where the competition wasn't. Keep spending on technology that enhances productivity during lean times and you will be positioned to crush your rivals when things pick up, he says.

But, of course, things haven't picked up. Welch is gone. And the country has grown cynical about business in general and GE's self-proclaimed position as America's iconic corporation in particular.

With all this as a backdrop,

the pressure has increased on the 48-year-old Reiner to demonstrate that digitization works, especially without Welch leading the cheers and catching the flak. But Reiner's numbers—\$1.9 billion in savings in 2001, according to the company—prove that he can execute on the grand scale. And the simple fact that the digitization effort continues, despite the drastic cutbacks in IT spending that have hit most big corporations, testifies both to Reiner's determination and to his clout within GE.

Today, Reiner is the man moving GE's culture from its traditional emphasis on people and processes to one that accepts technology as a third ingredient in the mix. "Gary was the one who got people focused and excited about the use of technology," says Marc McCluskey, a research director with Boston-based AMR Research and a former GE manager. "He evangelized that GE's people and execution culture begin to look more toward technology."

—Christopher Koch

Bumps on the Road to Digitization

It appears that Gary Reiner has convinced GE to embrace technology, but he's not been as successful in getting it to love the technology business. This year, GE sold off its most digital business unit, GE Global Exchange Services. Why? Bad cultural fit, says AMR Research's Marc McCluskey, a former GE manager.

"The key to educating people in GE is moving them across the different businesses," he says. "You can do that across different manufacturing businesses but the software business is too different."



HAL ROSENBLUTH

Chairman and CEO
Rosenbluth International Inc.

The travel industry, mired with endless offers and dozens of online brokers, is one of the most daunting industries to get a grip on. But Rosenbluth International's CEO Hal Rosenbluth relies on technology to simplify the complex web of travel industry processes and to give his clients the upper hand. The result, Philadelphia-based Rosenbluth International is considered a world leader in corporate travel management, with offices in 56 countries and annual sales in excess of \$3.5 billion.

Rosenbluth's philosophy on how technology can help business centers on the idea that technology can take the complex and make it simple. He believes that his greatest contribution is a technology called Dacoda (discount analysis containing optimal decision algorithms).

The Cowboy CEO

For someone born and raised in Philadelphia, Rosenbluth International CEO Hal Rosenbluth apparently makes just as good a cowboy as businessman. One close friend reports that he is a pro at branding—cows that is—at his North Dakota ranch, although he could use a little help on his roping skills.

Airlines have very powerful yield management systems, designed to extract the highest price for seat 18C. Dacoda works in reverse by cross-examining clients' travel patterns with qualifications for discounted airfares. It then lets clients know how they can obtain cheaper airfares. Dacoda has saved frequent fliers hundreds of millions of dollars.

Rosenbluth, 50, gets his ideas for new technologies by doing what his customers do: flying at least once a week, and listening to customer concerns. When online travel sites began cropping up everywhere, Rosenbluth implemented a technology that scans those sites and spits out the cheapest airfare. And after 9/11, Rosenbluth sensed the anxiety of fellow travelers and created a suite of security products with the ability to pinpoint a traveler's exact location and send an emergency message to him via PDA or cell phone.

A contrarian at heart, Rosenbluth is now working on something that would unnerve most executives in the travel business. He is lobbying hotels, suggesting they build videoconferencing rooms so that his clients can reduce travel budgets by conducting meetings via a local hotel room and a high-speed connection.

—Julie Hanson



CRM Implementation Time

UpShot average implementation time: Average time for implementation of UpShot CRM from May 2001 - May 2002.
CRM industry average implementation time: CIO Insight survey of 434 CIOs and Top IT Management, July 1, 2001.

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DON SCHNEIDER

Chairman
Schneider National Inc.

If it weren't for the Packers, Green Bay, Wis., would be famous as the headquarters of Schneider National, the largest full truckload carrier in North America and possibly the world's leading consumer of the pumpkin-colored paint that makes its trucks so familiar.

Schneider National is the only place that Don Schneider, 66, has ever worked, besides the military. The company was founded by his father, Al, in 1935, when he sold the family car to buy his first truck. Don joined the company full time in 1961 after graduating from the Wharton School of Business. He assumed leadership of the business in the mid-'60s, at a time when annual sales were about 2 percent of the \$2.4 billion they are today. Since then he's done more than any



Green Bay Is His Town

Being a celebrity, even if it's only in your own home town, can have its advantages. Before the advent of the ever-perplexing airport security process, Don Schneider had a reputation for arriving at the airport at the very last minute. Cutting it particularly close one day, he pulled his car up to the curb in front of the terminal, jumped out and ran for his flight. On his way to the gate and without breaking stride, he tossed his car keys to the first person he recognized. His car was delivered back to the company's parking lot.

one person to shape this industry

Schneider National hit CIOs' radars in the mid-'80s as the first truck line in the world to install two-way satellite communications and positioning systems in all of its 6,000 trucks—a \$30 million flyer. It has continued to lead the way with groundbreaking improvements in its e-business infrastructure, fleet management, in-cab technologies that monitor and reward driver behavior to maximize

equipment life, and employee retention technologies like Touch Home, an in-cab e-mail system to help drivers stay in touch with their family from the road.

As the largest carrier in a crowded industry, Schneider still has only about 3 percent of the market. The opportunities for competitive advantage boil down to customer service, operating efficiency and a motivated, energetic workforce. To do these things bet-

ter than anyone else, Schneider understands that it's not enough to embrace technology, you've got to get it in a headlock.

Schneider spends more on technology than any of his competitors. That makes him most CIOs' idea of the perfect boss—one who understands the value of leading with technology, uses his money to invest in it and has the guts to give it a try.

—Jerry Gregoire



RALPH SZYGENDA

Group Vice President and CIO
General Motors Corp.

After suffering three heart attacks, Ralph Szygenda's father stopped working at age 60, leaving his son to pay his own way through college. All things being equal, Szygenda says he would have gone to medical school. But things weren't equal, and with economic reality in mind, young Szygenda followed in his

father's footsteps and became an engineer, a field that all but guaranteed a job. After college he went to work at Texas Instruments, where he stayed for 21 years, becoming a chief information officer in 1989. In 1993, he left for Bell Atlantic, where he stayed until 1996, when General Motors—then the world's largest company—asked him to be its first CIO.

These days Szygenda, 54, thinks only about being a physician in rare moments of nostalgia. However, he frequently thinks like one. "I am known for diagnosing things," he says. "I know why things don't work right, and I can apply technology to the problem." Some of Szygenda's prescriptions at Detroit-based GM are well known. He is strong willed, tough as nails and always direct. Szygenda has cut the overall number of systems from 7,000 to 3,500, put in place an outsourcing business model (GM spends billions on IT every year but doesn't write a line of code inter-

nally) and is generally credited with helping to wake a slumbering giant. "I love what I do," says Szygenda. But he hasn't entirely given up on his medical school dream. "I still might go," he says.

—Ben Worthen

So You Want to Work for Ralph Szygenda...

Ralph Szygenda, who has personally hired close to 750 people, asks applicants the same three questions:

■ **What are the top three things you've done to help the business in the past five years?**

According to Szygenda, a good answer focuses on how the candidate improved the company as a whole.

■ **Where would your last supervisor rank your performance on a scale of one to 10?**

"I look for nines or tens," says Szygenda. "I think that you have to believe in yourself."

■ **What do you want to be doing in five years, and how will this job help you achieve that?**

"I have to believe that they are dedicated to this step," he says. "When I bring in a person, I dedicate my heart and soul to support them."



Challenge
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me.

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me.

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me.

KEVIN TURNER

President and CEO
Sam's Club

Getting Kevin Turner to discuss his personal accomplishments at Wal-Mart is as tricky as hooking a striper with a nymph lure.

Turner, a demon fisherman and the former CIO of the Bentonville, Ark.-based mega-merchant was promoted to president and CEO of its Sam's Club division last August. He insists that he wouldn't be where he is today were it not for the myriad mentors who encouraged him to search for transformational ideas, stretch his limits and put the customer first. Not to mention the energy and talent of his IS staff, and the advice and support of Shelley, his wife of 13 years.

"It's really all the people I work with who deserve the credit," he insists. "They're the ones that deal with our customers and deliver the programs, that answer the phone calls and work the trouble tickets. I just kind of front the deal."

Which at the very least seriously understates the magnitude of the 37-year-old Turner's contributions to the world's largest retailer. He joined the company as a clerk in 1985, and was, at one time, the youngest Wal-Mart employee ever to be named a corporate officer (he was appointed vice president of application development at 29). His friends will point out that he introduced handheld computers to store associates way back in 1992, bringing back-office employees out on the floor to help customers. They'll say that his understanding of retailing—and his ability to use IT to solve its problems—is what powered his rise in the organization.

And they'll tell you that Turner is a master motivator. "Kevin does one of the most outstanding jobs of any executive in the entire company of making his people feel like a team," says Thomas Coughlin, president and CEO of the Wal-Mart Stores Division.

"When you teach and explain and involve people in the business, and show them the value that they have and their ability to contribute, when you care about them and do it genuinely, they give you their heart," says Turner. "When you adopt a philosophy that it's the people that make the difference, your effectiveness as a leader goes up astronomically."

—Meridith Levinson



Words to Live By

Kevin Turner is addicted to homilies, aphorisms, inspirational sayings and pithy quotes. He collects them, uses them to motivate and communicate, and, when asked, rattles them off. His favorites include:

■ *Hard work doesn't guarantee success, but the absence of it almost certainly guarantees failure.*

■ *In the game of life, even the 50-yard-line seats don't interest me; I came to play.*

■ *Focus on the things you can control, and the only thing you can control is you.*



MEG WHITMAN

President and CEO
eBay Inc.

Meg Whitman was minding her own business, overseeing global marketing for the Mr. Potato Head and Playskool brands at Hasbro, when she got the headhunter's call: Would she want to run a tiny Internet auction company in Silicon Valley? Even though her first reaction was a definite "nope," she flew to San

Jose, Calif., anyway to meet eBay founder Pierre Omidyar. While there, she saw the makings of a great brand and a profitable business. In February 1998, Whitman signed on as eBay's CEO. And today, she is responsible for the largest operating margin of all publicly traded dotcoms—an impressive 30 percent.

Whitman, 45, presides over eBay from a cubicle, yet she arrived with a decidedly corporate résumé, including degrees from Princeton and Harvard and stints at Bain, Disney, FTD, Procter & Gamble and Stride Rite. As a

result, she's very bottom-line focused. "She manages costs very closely," says Bob Quinn, who was eBay's CIO from June 1999 to early 2000. While the rest of Silicon Valley burned through VC cash in a seemingly mindless grab for customers, Whitman always demanded a clear time line for return on every investment in growing eBay, says Quinn.

When eBay suffered outages during the summer of 1999, Whitman would call the IT staff

The Customer Is Always Right (Even If She's in Guatemala)

Meg Whitman's passion for customers—some 100,000 of whom make their living on eBay—drives most of her business decisions. When eBay wired a Guatemalan village so that local craftswomen could trade their wares online, Whitman made the trek to Guatemala to meet the craftswomen—even though it meant staying in a \$5-a-night hotel with dogs chained up out back and scorpions in the rooms.

Throughout the night, Quinn recalls. If there was a crisis at 4 a.m., she'd show up in jeans and a T-shirt to assess the situation and to get accurate information to share with the outside world. That experience led her to invest heavily in creating redundancy, says Adam Cohen, author of *The Perfect Store: Inside eBay* (Little Brown & Co., 2002). "It's bad when technology goes down in any company," Cohen says. "She understood that the second technology goes down at eBay, the whole company isn't there."

—Alice Dragoon

As a

—Alice Dragoon

The AMD logo, consisting of the letters "AMD" in a bold, sans-serif font, followed by a green square icon containing a white stylized arrow pointing upwards and to the right.

AMD

The text "AMD me." is overlaid on the image. "AMD" is in large, white, bold, sans-serif capital letters. "me." is in a smaller, green, lowercase, sans-serif font with a period. The background of the entire advertisement is a photograph of a busy office with several people working at desks with computers. A man in a suit stands in the background, looking towards the camera. A woman in the foreground is looking at a laptop. Another man is looking at a document. The office is cluttered with papers, books, and computer equipment.

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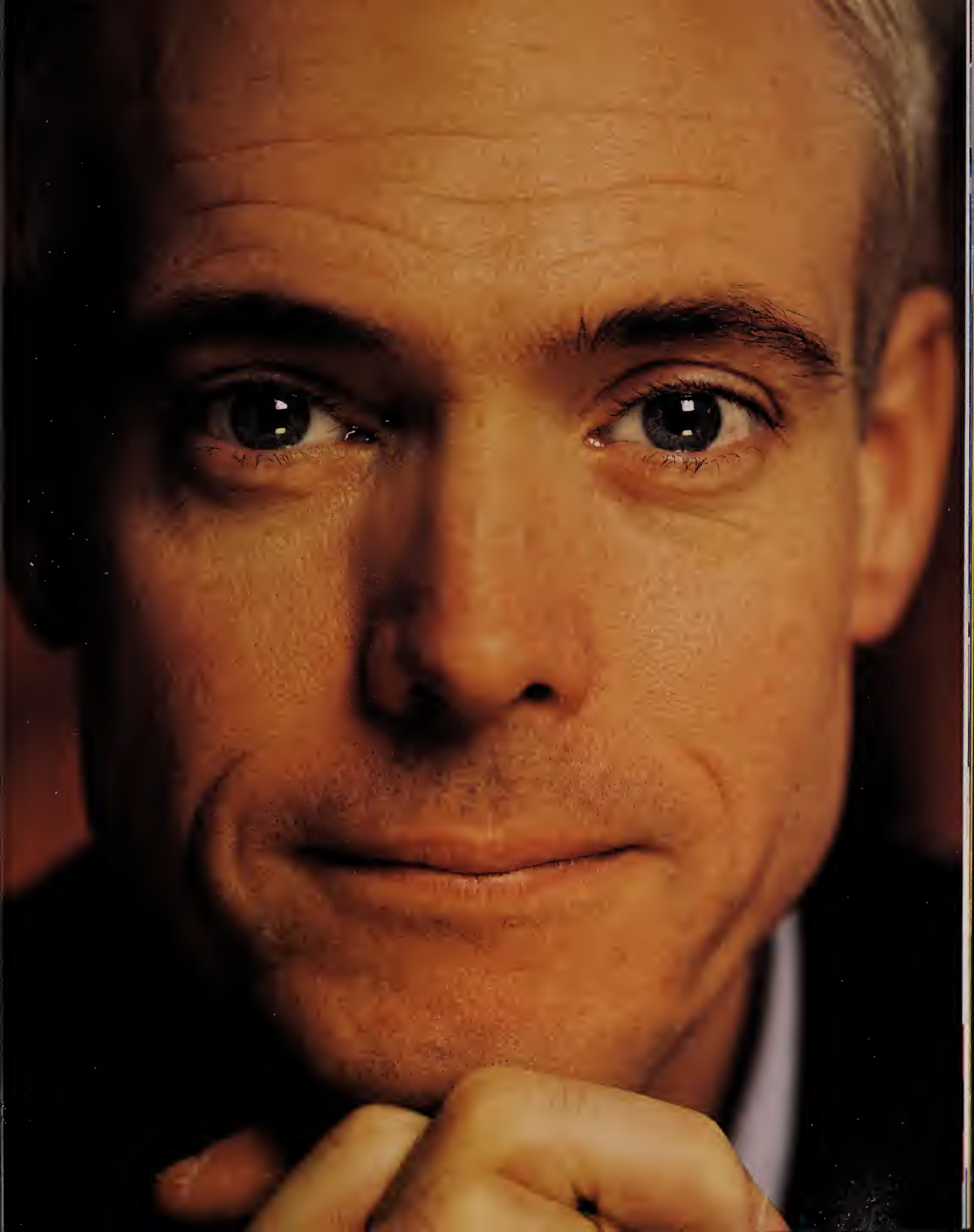
Business history is littered with great ideas that never crossed paths with great managers and as a result fizzled. Technologies are just so much R&D expense until they're deployed by those who have the vision to recognize the great ideas and the skill to implement them successfully. That's why half of the 20/20 Vision honorees were chosen—for their ability to recognize and shepherd great technology ideas through the organizational maze. In other words, they're great leaders.

But how does one become a great technology implementer? And how big a role does technology play in organizational success, anyway? We consulted management pundit Jim Collins, author of the best-selling books *Good to Great: Why Some Companies Make the Leap...and Others Don't* (HarperBusiness, 2001) and *Built to Last: Successful Habits of Visionary Companies* (HarperBusiness, 1994,

coauthored with Jerry Porras), for insights on organizational leadership. Collins, a former Stanford Graduate School of Business faculty member who now runs his own management laboratory at the base of the Flatiron mountains in Boulder, Colo., underscores our point that it's not just about the technology. He's uncovered some seeming paradoxes about how great companies use technology:

- ▶ Outstanding organizations are pioneers in IT and other forms of technology—yet technology is a minor contributor to their success.
- ▶ Early technological leads are an impediment to organizational staying power.
- ▶ The best leaders are those who focus on a handful of useful technologies and ignore the rest, no matter how exciting the bandwagon looks.

BY EDWARD PREWITT | PHOTOGRAPH BY CHRIS SHINN



TECHNOLOGY ACCELERATORS

To write *Good to Great*, Collins and his research team spent five years studying great companies (defined as those generating sustained outstanding stock returns), narrowing down the universe of American business to a mere handful of stars. He then asked executives from this select group to identify the top-five factors that contributed to their success. Most surveyed didn't mention technology at all. Those who did ranked it fourth out of five factors. "Given that we live in a technology world, this was really surprising," says Collins. "You could draw the conclusion that technology basically doesn't play a role in excellence."

But that would be the wrong conclusion. "Regardless of what they said, every single one of the companies had become a pioneer in the application of technology," he says. "On the one hand, they hardly place any emphasis on it, yet on the other hand, there is no question they were pioneers in the application of technology."

When Collins set out to explain this, he discovered that organizational greatness always came first. "If you're fundamentally mediocre going to worse," he says, "other people applying technology can be a further accelerator of your own demise. If you're a good company going to great and want to stay there, technology can become an accelerator once you've made that leap, but it cannot cause it by itself."

Among our 20/20 honorees, Hal Rosenbluth used IT to become a leader in the corporate travel management business—but his source for innovative ideas is customer experiences rather than new offerings from technology vendors. When Meg Whitman took the reins at eBay, her first concern was to prove that a dotcom could be financially disciplined. Only then did she concentrate on getting her IT knowledge up to speed.

THE DARK SIDE OF BRIGHT IDEAS

It's appealing to think that the best implementers built their companies around inspired ideas. But it's wrong, Collins says. In researching *Built to Last*, he found that an early technological lead can actually hinder

long-range success as managers focus on the technology to the detriment of the organization.

In comparing 18 exceptional, long-lived companies with their competitors, Collins found "in case after case that the early leaders in specific technologies did not end up becoming the enduring, great companies. We saw in a lot of [the short-lived] companies people who were not great company builders, but they had a great idea that was right for the time. But once the product runs out of steam, there is no great company behind it to be able to have a dynamic process."

For example, Westinghouse's technology gave it a transient lead over General Electric in electricity transmission. "George Westinghouse came up with the AC electrical system; Charles Coffin at GE came up with the idea

your responsibility to ensure that the organization invests in them." Those two or three technologies are of the highest priority for leaders. "You must become a pioneer in their application. If you really want to be great, it's not good enough to be at the threshold."

The 20/20 honorees provide several examples. Michael Prince has a reputation of being the first CIO on the block to try out new technologies. Yet he implements only those systems directly applicable to the discount retailing business. The result is that where his company, Burlington Coat Factory, goes, industry standards often follow. David Kepler of Dow Chemical and Don Schneider of Schneider National trucking each spend heavily on leading-edge IT implementations, but their (very different) investments are focused squarely on their industry needs.

Collins believes the idea of a first-mover advantage to be a chimera: "Technological leads never last more than a few years."

of systematic management development. Which is a more important breakthrough?" asks Collins. "They are both significant, but from the standpoint of a company, I'll take management development any day."

Collins believes the idea of a first-mover advantage to be a chimera: "Technological leads never last more than a few years."

THE IMPLEMENTATION TRIO

One distinguishing characteristic of great leaders, Collins has found, is an intense focus on what their organization needs to do well—and what it shouldn't be doing at all. In keeping with this single-mindedness, outstanding leaders implement technology at three levels.

The first level is those technologies directly relevant to a company's mission. For any organization, a few technologies hold the potential of substantially improving operations and results. "If you get very clear about what are the few things you ought to be doing, it is not going to be a whole lot of things," Collins says. "On the other hand, there are going to be two or three where it's

A second type of technologies are those that lack revolutionary potential but that organizations need anyway. For some companies, websites fall in this category. "In a Web world, you've got to at least have a passably usable website, because there are certain expectations that people have come to have," says Collins.

Finally, there are some technologies that are nothing more than a distraction. "If you don't have to have them, and they don't tie directly to your [mission,] then the point is to have those on your 'stop-doing' list, even if the whole world is heading toward that."

In sum, good technology implementation is important for a company, but being a good company first is even more important. The best technology implementers are executives above all. **CIO**

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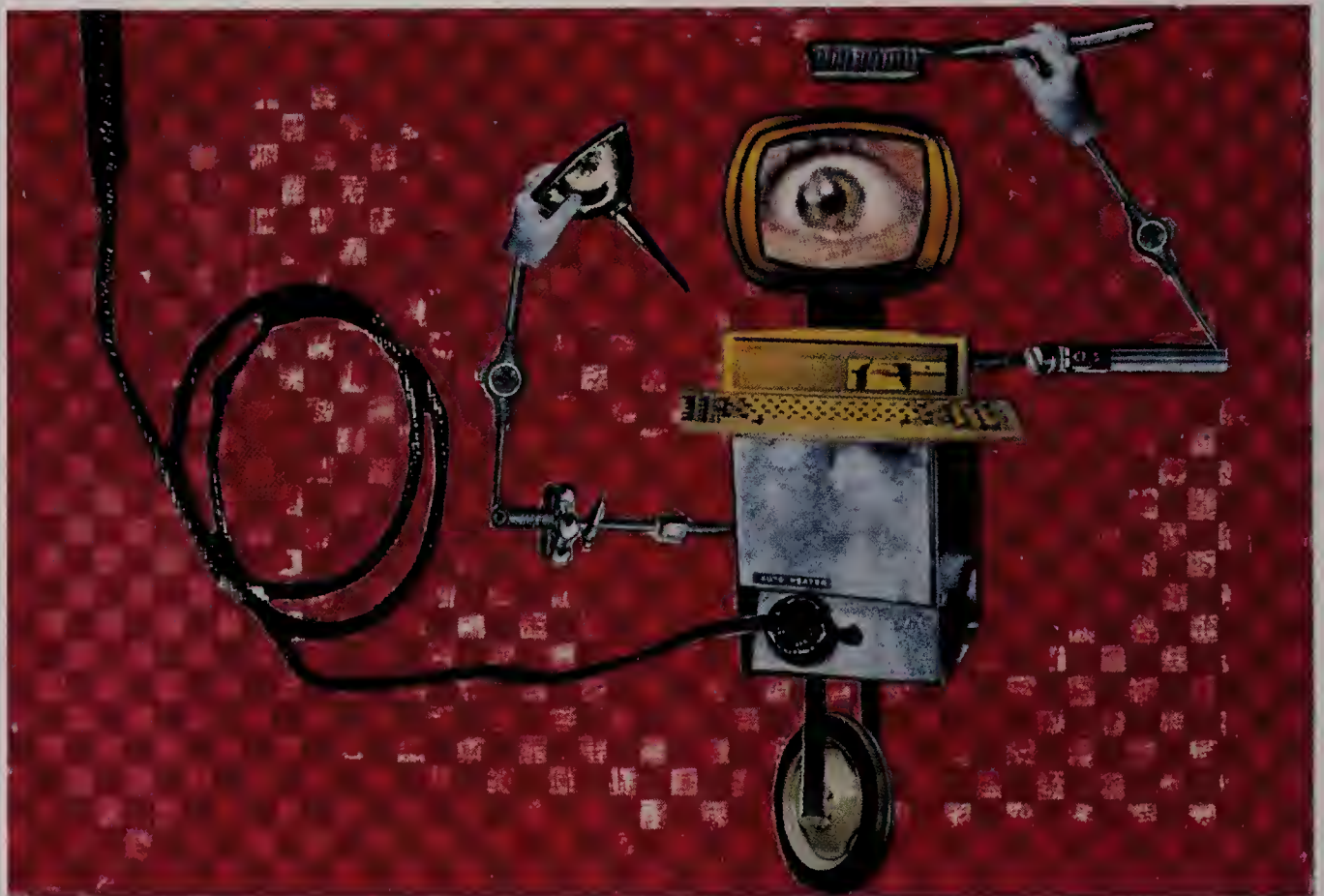
Emerging technology

INNOVATION and PRODUCTS in the VANGUARD

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It's Alive!

Don't you wish the data center could look after itself?

BY ERIC KNORR

Edited by Christopher Lindquist. Send your thoughts and ideas for future columns to clindquist@cio.com.

LET'S SAY YOU DECIDE to go for a run. After a few minutes, your breath quickens, your heart rate increases, and you start to perspire. All this happens whether you think about it or not—because your autonomic nervous system has

roused the right organs to respond to the increased load on your body.

Autonomic computing, a phrase coined by IBM, describes technology that self-regulates and even heals itself much as the human body would

Miniature mirrors...Autonomic computing

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do. "When I say technology, I'm including all of the software, all of the applications, all of the storage, all the pieces of the infrastructure," explains Irving Wladawsky-Berger, vice president of technology and strategy for IBM's server group. "Now, I don't mean any far out AI project. What I mean is that...instead of the technology behaving in its usual pedantic way and requiring

tions that monitor the data center and automatically provision servers and deploy applications.

"Autonomic computing is just the IBM term," says Duncan Hill, CTO of Think Dynamics. "There are a lot of terms out there that ultimately mean the same thing: Computing infrastructure that adapts to meet the demands of the applications that

across platforms. All these solutions, including IBM's eWLM, share three characteristics: virtualization of resources, network monitoring and automated response to change based on rules established by data center administrators.

Rather than just virtualizing storage, autonomic solutions virtualize the whole infrastructure so that data center resources can be divvied up dynamically to meet the needs of applications. Autonomic systems will pool processing, memory, storage, bandwidth and so on, and then dole them out on the fly. In a sense, self-management software plays the role of a data center operating system, allocating the resources of the data center as if it were one big machine.

While data center virtualization is a fairly new concept, network monitoring—the input side of the autonomic computing model—is as old as the hills. In fact, autonomic solutions typically rely on data collected by such established products as HP OpenView or Tivoli Enterprise. "There are lots of ways of reading an environment to see if it's broken," observes Al Wasserberger, CEO of Spirian, a software distribution company that also specializes in adding automatic deployment and self-healing capabilities to other companies' software. "There are not very many ways of automatically fixing it so that it's no longer broken." Whether self-healing or throwing computing power at needy apps, the capability of the data center to take action on its own—based on network monitoring data and rules set by administrators—forms the indivisible core of all autonomic solutions.

Autonomy Meets Reality

Every IT manager likes the idea of providing high service levels to the enterprise at a low cost and with far less maintenance hassle. That is especially true with data center utilization hovering at a remarkably low 20 percent, according to many analysts, mainly because those corporations must reserve significant capacity for disaster recovery or spikes in demand.

"The challenge in the data center is to

The mind-numbing complexity of today's data centers makes the need for self-managing systems acute.

—Irving Wladawsky-Berger, vice president of technology and strategy for IBM's server group

a human being to do everything for it, it starts taking care of its own needs."

According to Wladawsky-Berger, the mind-numbing complexity of today's data centers makes the need for self-managing systems acute. At current growth rates, IBM projects that demand for skilled IT personnel will increase by more than 100 percent in the next six years—to the point where there simply won't be enough available talent to maintain the infrastructure. To avert this Malthusian crisis, IBM launched its eLiza initiative last year, with the ongoing objective of spreading autonomic features across IBM's hardware and software product lines. As these enhanced products roll out and begin working together, IBM declares that eLiza-enabled systems will display four distinct attributes: self-optimization, self-configuration, self-protection and self-healing.

But IBM is hardly the only company answering the need for self-managing systems. Its big hardware rivals have similar schemes: Hewlett-Packard touts its utility-based computing, while Sun Microsystems' amorphous N1 initiative describes a computing environment free from the drudgery of manually allocating resources. And several startups, notably Terraspring and Think Dynamics, are already shipping solu-

are running in it." In other words, IT develops and deploys applications, and the infrastructure more or less takes care of itself—adjusting automatically as applications and workloads change. The ultimate effect is not only less work but also much more effective utilization of data center resources.

From Here to Autonomy

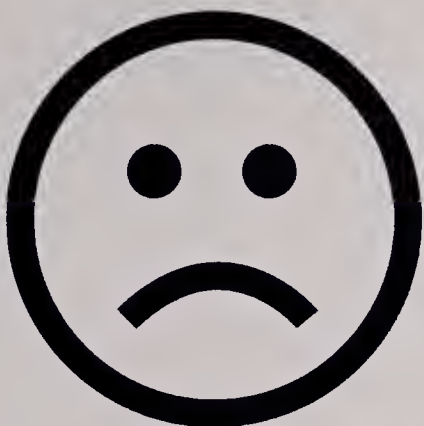
How far away are we from this spectacular simplicity? That depends on how you define autonomic computing. IBM's eLiza project encompasses everything from server hardware to self-healing databases to security management. Some of those elements, such as IBM eServers that detect and isolate bad memory chips, have already arrived, but the key software—IBM's Enterprise WorkLoad Management (eWLM) suite—will remain in beta until next year. In any event, analysts agree that pulling such a wide range of IBM products into an organic, self-managing whole will take years.

The narrower definition of autonomic computing—put forth by such startups as PlateSpin, Sychron, Terraspring, Think Dynamics and others—addresses neither security nor vendor-specific hardware features, instead focusing on server provisioning and workload management that function



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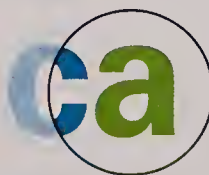
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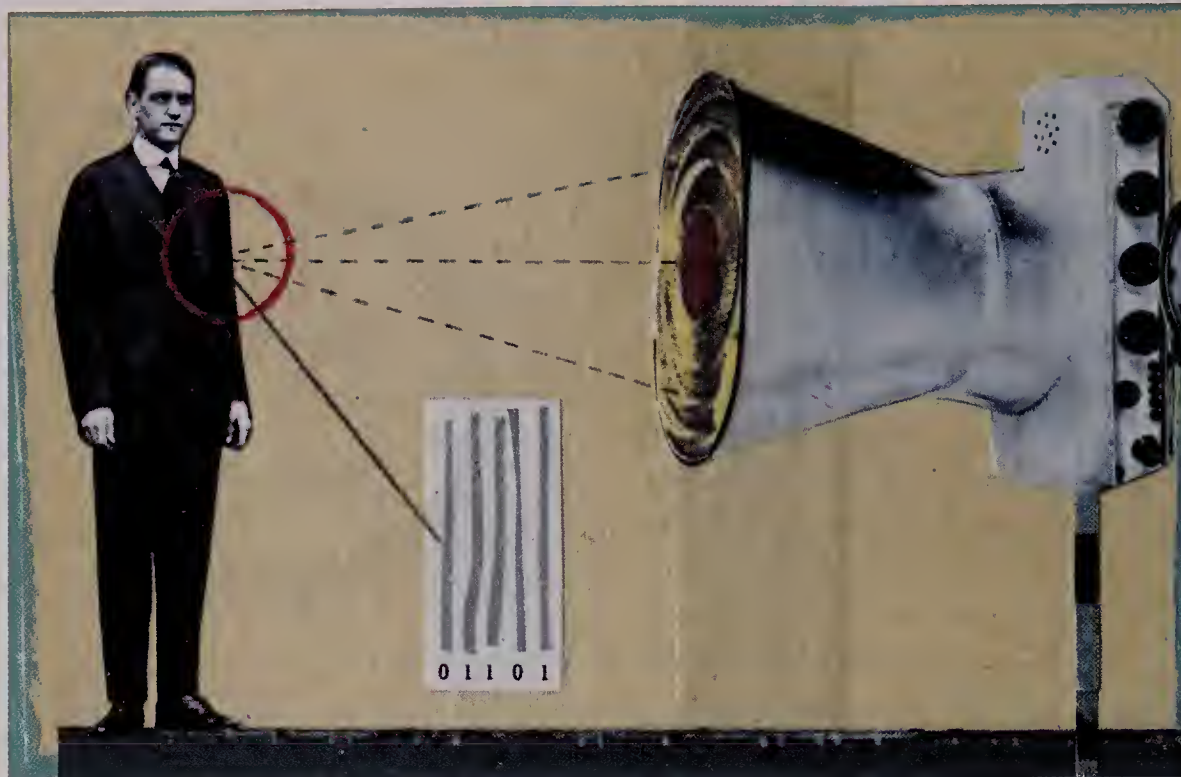
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make better use of all of those devices that we bought during the heyday, when acquisitions were easy, when money was flush," says Vernon Turner, an analyst and group vice president for IDC (a sister company to CIO's publisher). "Now we're in a situation where we don't have the money, but we have to provide the same amount of service. We don't have the resources to do that, so by far the easiest route is to automate as much of that function as possible."

On the other hand, no self-respecting CIO would hand over the whole data center to an unproven autonomic solution. "It's like HAL, where the data center has a mind of its own—and maybe ends up setting up an Internet gambling site," jokes Huw Morgan, CTO of Canadian service provider Bell Globemedia, which is currently evaluating Think Dynamics' ThinkControl software. In fact, Globemedia and other early adopters, such as IT outsourcing company InFlow, plan to roll out autonomic solutions incrementally, outside the production infrastructure.

Terraspring's CTO Ashar Aziz notes that in addition to the production infrastructure, there are many "shadow infrastructures" to consider. He takes the example of financial services companies, many of which have recently upped their IT budgets in only one area—disaster recovery. If a company has 50 servers in production and 50 in disaster recovery, IT should be able to commandeer the redundant infrastructure for such noncritical applications as quality assurance or staging. "Should a disaster occur," says Aziz, "you simply load the disaster recovery template for that infrastructure, and you're ready to go. It's a great way to leverage wartime assets in peacetime, because wartime is a rare event."

On a nuts-and-bolts level, those changes in data center personality amount to automated server provisioning. For example, an autonomic data center might respond to a surge in Internet traffic by grabbing servers from the application tier and re-provisioning them as frontline Web servers—



UNDER DEVELOPMENT

Micromirrors

It Reflects Well On You

TODAY YOU MAY check your clothes in the mirror. Tomorrow you could be checking the mirrors on your clothes. MIT researchers have created high-performance mirrors in the shape of hairlike flexible fibers that can be woven into cloth or incorporated into paper. The technology could one day reside in clothing with an embedded reflective code or in protective gear for emergency personnel.

The mirror fibers are based on a nonmetallic "dielectric mirror" developed by Yoel Fink, an MIT assistant professor of material science and engineering. Like a conventional mirror, Fink's invention can reflect light from all angles and polarizations. Unlike its traditional counterparts, however, the fiber mirror can be tuned to reflect certain wavelength ranges. This means an array of mirror fibers, or even a single fiber, can reflect light at different wavelengths to create a kind of optical code (a code that could be discretely detected at security checkpoints, for example).

To develop a fiber version of the dielectric mirror, Fink and his coresearchers constructed a cylinder—measuring about 30 centimeters long by 25 millimeters in diameter—to pack 21 layers of dielectric materials around a polymer core. They then fed the package into a furnace and fiber-optic "draw tower" and pulled the bundle into threadlike fibers. Fink says the process requires exacting control. "Typical glass fiber has only a few, fairly large internal features," he notes. "The mirror threads contain over 21 features, and thickness control needs to be kept to under one micron." By using materials that can be thermally processed at the same temperature, Fink and his team were able to minimize defects while drawing mirror fibers hundreds of meters long.

Mirror fibers have potential applications that go beyond wearable identification. Scientists could also design fibers to reflect thermal radiation over various temperature ranges, useful in heat-protective clothing worn by firefighters, soldiers, astronauts and others who work in searing environments. "It's a low cost process, so we think it will lead to a variety of practical applications," says Fink.

—John Edwards



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automatically loading them with all the software necessary for their new role. "This is what autonomic computing is really about," says IDC's Turner. "It's about the ability to provision resources." Last year, IBM unveiled a technology demo dubbed Project Océano, in which a farm of Linux servers showed off automated provisioning capabilities.

Quick provisioning is a big selling point for Ed Denison, former director of global operations for outsourcing giant Computer Sciences Corp. (CSC). Denison likes the speed with which Terraspring's software

IBM's autonomic computing initiative, according to Van Symons, global marketing executive for eLiza. But the company has loftier goals in mind than merely reducing IT head count.

In IBM's view, the autonomic data center goes hand in glove with the company's "grid computing" initiative, in which distributed networks of data centers can be virtualized to work as a single computer. Although largely confined to scientific applications so far, grid computing for commercial applications may one day enable the "utility" or "service" model of

Self-management software plays the role of a data center operating system, allocating the resources of the data center as if it were one big machine.

can respond to trouble and build a new server from scratch. In a demo Denison does for customers, "I tell the guy to pull any cable he wants. Before we can get back to the room where the screen is up, the pager on my belt goes off. And by the time we get back, the guy doing the demonstration has already queued up the replacement server and is probably five minutes into reinitializing it."

Using Terraspring's solution, Denison estimates that he could save as much as \$300 per month in labor costs per server. For customers such as J.P. Morgan Chase, for which CSC maintains 16,000 servers, that's hardly chump change. And Denison sees an opportunity to dramatically increase the number of servers his administrators can handle over the long haul. "Normally you get 18 servers per administrator," says Denison. "Our goal is to get closer to 40 or 80 or 100."

Enabling the Future

Listening to the needs of IT execs such as Denison was the main impetus behind

computing, where customers will tap into computing power much as they plug in a toaster and tap into the electric power grid today. The ultimate goal, according to Wladawsky-Berger, is to turn the Internet into one giant virtual computer.

Who knows, however, when such grand concepts will touch the ground. Meanwhile, IBM deserves credit for reminding us that the flood of fabulous new IP-based technology that has arrived in the past few years is worth very little if you can't make it work without breaking the bank. Worse, if we spend too much time scrambling to shore up what's already been deployed, we'll stop forging ahead. As Symons says, the cost savings promised by autonomic computing isn't the only attraction. "The real benefit is the speed with which I can now deliver more applications—and not spend all my time building and managing the infrastructure," he says. **CIO**

A veteran of numerous industry trends real and imagined, Eric Knorr is a freelance writer and consultant based in San Francisco.

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LEADERSHIP AGENDA | 120

By Susan H. Cramm

A Letter to CXOs

How comfortable do you find the hot seat? E-mail Leadership and Management Editor Edward Prewitt at hotseat@cio.com.

Advanced Leadership Learning

What you can learn from education courses for federal government CIOs

BY POLLY SCHNEIDER TRAYLOR

He is 19 years old, with no college degree. He has just been promoted to manage the night shift at Bradford National Computer Services in Teaneck, N.J. His 15 employees are all at least twice his age. He holds a meeting to get the age issue out on the table, assuring the staff he will have an open leadership style. He also informs them that he won't tolerate people sleeping at work or sneaking off to the neighborhood bar. He's seen them do that before, but they better not try it under his watch. Most of the workers eventually back him up, but a few don't, undoubtedly thinking, Excuse me, but I'm not taking orders from a teenager. First test of leadership: Make it up as you go and pray for survival.

That was Vincent Scilla in 1976; Vincent Scilla today is a veteran IT executive, having been CIO of Mellon Investor Services in Ridgefield Park, N.J., until recently. So it may come as a surprise that Scilla, with proven leadership abilities and years of senior management under his belt, would sign up for a leadership education course. Yet Scilla says his recent experience at Carnegie Mellon University's CIO Institute was invaluable—particularly the program's four-day leadership module. The hard-charging 45-year-old New Jersey native believes he is now more patient, due to the extensive knowledge of organizational culture and personal psychology he picked up at the institute.

Leadership education can be broad, vague and generally unhelpful unless it gives participants practical information and tools they can immediately apply back at the office. For senior managers especially, the curriculum should be hands-on, highly interactive and focused

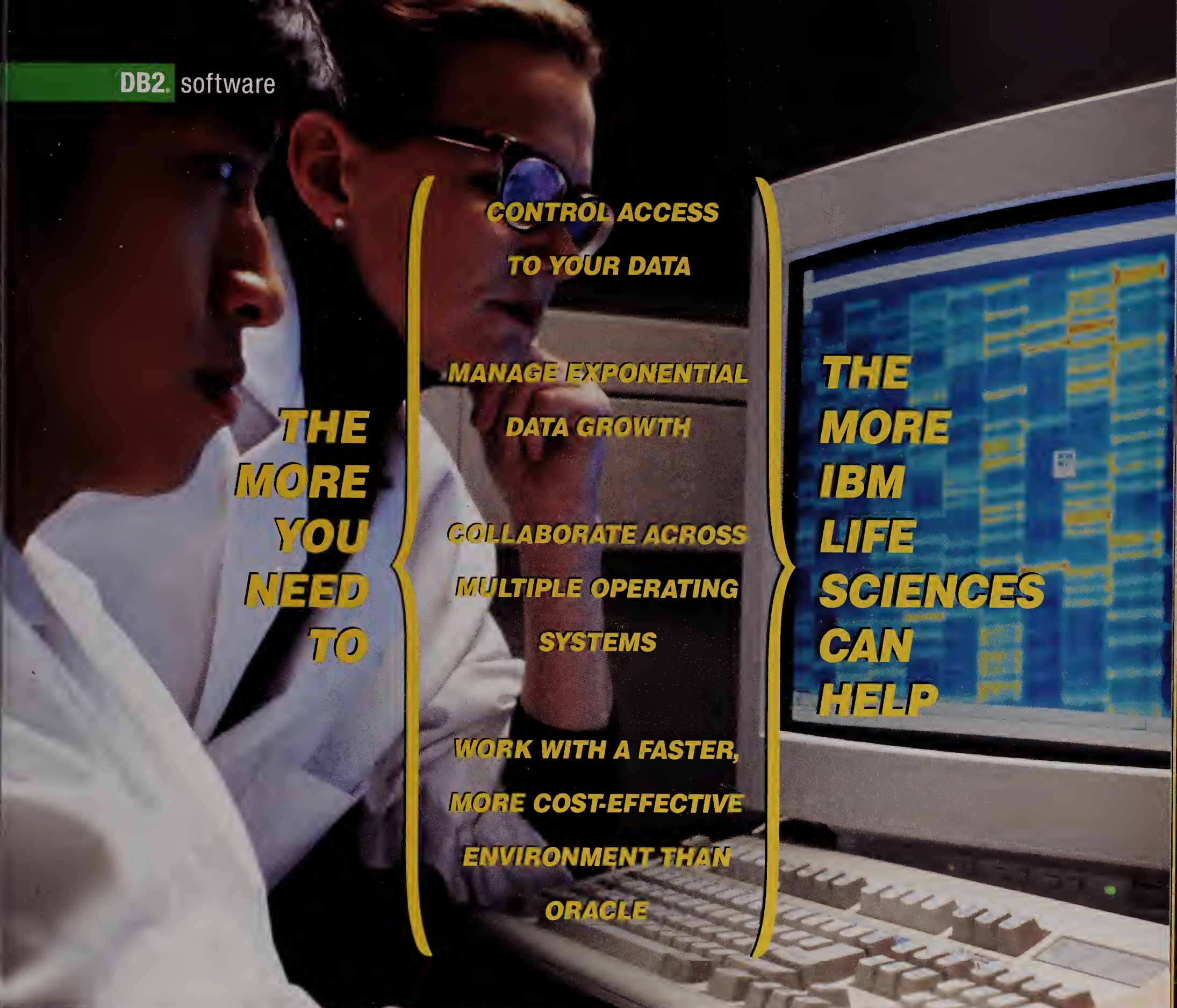
on self-growth rather than textbooks, and the schedule must be convenient and flexible. "From my perspective I have an operation to run, so I need application, not theory," says Jeannie Winston, CIO at the University of Arkansas and a graduate of the CIO Institute.

The institute accomplishes these aims while allowing CIOs to interact with like-minded colleagues. Launched in 1999 to



Terri Morgan (left), CIO of the Department of Energy's Chicago operations, learned negotiation at the CIO Institute, where Richard Friend teaches.

fulfill the educational mandate of the federal CIO Council, the institute is aimed at up-and-coming federal government IT chiefs. By design, a quarter of the participants come from the private sector so that the two sides can see how the other half lives. Students must complete eight courses—each have four- to five-day modules occurring every other month—in order to receive a CIO certificate from Pittsburgh-based Carnegie Mellon.



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IBM

Hot Seat

Students rate the leadership module as the highlight of the program, which also includes units on strategy, information security, e-government and others. Former students say they are seeing results. Scilla says the course's hands-on exercises were more applicable to his career than those from past management training. In particular, a 360-degree leadership inventory survey told Scilla that colleagues and direct reports felt he was weak at challenging employees to do their best. Scilla began looking for ways he could put himself on a limb without jeopardizing his job.

A golden opportunity arose when he was offered a job as the head of Mellon's new consulting subsidiary. Instead of charging clients by the hour, Scilla felt the more competitive route was to offer a fixed price per project. The outcome was mixed, but the division did not lose money, and Scilla learned an important lesson in how to take calculated risks. Ready for a change, he left Mellon in January and now brings his leadership survey results to job interviews—another chancy move but one that he believes builds trust with potential employers.

Terri Morgan, CIO of the Department of Energy's Chicago operations, had to lobby her boss for approval to attend the CIO Institute and cut her department's travel budget to cover the bimonthly trips to Virginia. But she says the course was well worth the sacrifice, particularly the negotiations strategy part of the curriculum. The skills came in handy when her boss wanted to have an all-important IS group secretary also work with the HR department, a move that Morgan knew would be too much for any one person. Armed with advice from her classmates, she approached her boss with a compromise solution to share the secretary with another, smaller department, to which the boss finally agreed.

The CIO Institute strives to differentiate itself from other leadership courses by focusing on classroom interaction and experiential learning, according to instructors Mary Gail Biebel and Richard Friend, both organizational development consultants. On the first day, Biebel and Friend ask students to introduce themselves by sharing stories of leadership challenges from their work or personal life. Later in the day, small groups of students break out to discuss the results of their leadership surveys, analyze each other's personality traits and discuss how those affect leadership styles. On days two and three, the instructors cover strategies for managing large-scale change in organizations, resolving conflicts and negotiating. "Some of [the tools] are so sim-

ious stages of planning a change. Using the matrix consistently, Biebel says, helps illuminate the surprise factor that often accompanies major changes. Another exercise oft-cited by graduates of the course is a card game in which the players seated around the table do not share the same rules and cannot communicate other than through hand signals. "It helped to understand office structure—how a new person often doesn't understand the rules and expectations," Morgan says.

Leadership Lessons

Although Biebel and Friend say that CIOs require an analytical and practical approach to leadership, many of the concepts they learn at the CIO Institute are

JAMES KOUZES ON EXECUTIVE EDUCATION

Three tips from the coauthor of *The Leadership Challenge*

Who Benefits from Leadership Education Even though they might not formally oversee others, young and inexperienced managers should be given equal consideration with seasoned execs, since leaders take a long time to develop. "I view leadership as everyone's business," Kouzes says.

The Failures of Leadership Education Too few companies are investing in it, given the stringent economic times. Too many courses focus too much on strategy and not enough on the emotional side of leading. Finally, beware of the one-stop solution for improving leadership skills; it doesn't exist.

The Best Ways to Learn Leadership Diverse experience, role models and interactive exercises where leaders can get feedback from others are all important components of leadership training. "If I have worked only in one function with one group of constituents, in one city, in one company, I am very limited in my capacity as a leader," Kouzes says.

—P.S.T.

ple it's almost embarrassing," says Biebel, who holds a PhD in counseling psychology. "But I work with a lot of senior people, and if it takes more than five minutes, they won't use it."

One such tool is the Payoff Matrix, a form that helps leaders map out the var-

the same for any aspiring executive. When the federal CIO Council approved the program, it handed Carnegie Mellon a list of 80 learning objectives, which include standard management fare like communication skills, group behavior principles and decision making (see "An Objective

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SOLUTIONS



Hot Seat

Syllabus," this page).

Using the learning objectives as a guideline, Biebel and Friend have incorporated their own experience

of coaching leaders in corporate America, along with concepts from *The Leadership Challenge* by James Kouzes and Barry Posner (Jossey-Bass, 2002). The best-selling book provides instruction on developing five practices of "exemplary leadership": challenging the process, inspiring a shared vision, enabling others to act, modeling the way and encouraging the heart.

For his part, *Leadership Challenge* coauthor Kouzes says great leaders are not born from the classroom. "Work-life experiences are still the best and most available opportunities for learning," he says. Although Kouzes, a San Francisco-based leadership consultant, recommends a minimum of 50 hours per year of formal training, he says leadership development for executives should also include regular opportunities for gathering feedback, reflecting upon and recording lessons from critical incidents, and meeting with an adviser or coach.

Kouzes believes that leadership education fails when it is either too broad—such as survey courses at a university—or too narrow, as with vendors that claim their product is the 100 percent solution. In his view, the most important learning for leaders is to understand how to deal with the emotions of others. This ability is more important than ever given the changing context of leadership. The recession, the horrific events of 9/11 and the ongoing corporate accounting scandals have created a climate of uncertainty in which leaders must demonstrate caring, respect for others' values and commitment to people over profits, Kouzes says.

Biebel agrees that making classroom learning applicable to real-life challenges is not easy. Too often, leadership training

MANAGEMENT BRIEFS An Objective Syllabus

Elements of a CIO Education

The federal CIO Council, created by a 1996 executive order as the principal forum for senior IT managers in federal agencies, produced a set of "high-level competencies" that government CIOs need. A group of government executives, academics and industry CIOs then extracted from the competencies a list of specific learning objectives, to be used by Pittsburgh-based Carnegie Mellon University, and a few other selected institutions for training up-and-coming CIOs.

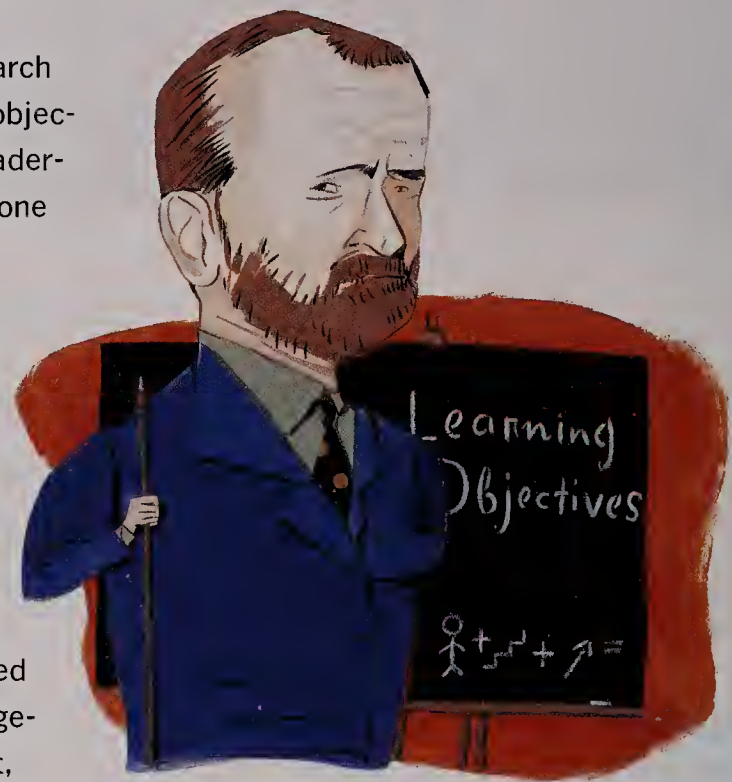
The full list, finalized in March 2001, came to 549 learning objectives in 12 categories. The leadership/managerial category alone has 80 learning objectives (LOs for short). Carnegie Mellon drew from this roll to shape the curriculum for its CIO Institute leadership module (see "Advanced Leadership Learning," Page 114).

The leadership and management LOs are prefaced with a note that says, "management concepts are important, but CIOs must move beyond management to LEADERSHIP." In practice, says CIO Institute instructor Richard Friend, helping students differentiate between management and leadership is one of the more difficult aspects of the class. "The reality is it's blurry," he says.

In disaggregating leadership and management, the federal LOs emphasize the importance of interpersonal success. Other discrete skills on the

list are communication and conflict management. On the whole, though, the LOs give more weight to research concepts such as behavioral principles, theories of motivation and the different types of visionary leadership. Other LOs deal with building expertise, performance assessment and retention. A section of the leadership and management LOs is devoted to knowledge management.

Don McGillen, founder of the Carnegie Mellon CIO Institute, lauds the list of LOs. "As a body of knowl-



edge for the CIO job, it's pretty good," he says. Although 549 LOs might seem like a lot to fit into a course, "they get covered in a very natural way," he says.

For the full list of federal government learning objectives for CIOs, search for the CIO University Learning Objectives on www.gsa.gov.

—Edward Prewitt and
Polly Schneider Traylor

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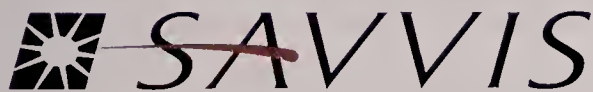


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fails because it ends with the course. Students take tools (if they learn any at all) back to work without advice on how to

apply them. Overcoming this tendency calls for initiative and commitment, despite whatever tricky corporate culture the executive faces at the office. "The task of leadership is to do it even if it's hard," Biebel says.

With effort, most people can improve their leadership skills—but wanting the responsibility is another thing. Good leaders must have an underlying desire to solve those tricky human relations problems that surface every day. "If you don't enjoy managing or leading people, you're in the wrong job," Scilla says. If nothing

"Some of the leadership tools are so simple it's almost embarrassing. But I work with a lot of senior people, and if it takes more than five minutes, they won't use it."

—Mary Gail Biebel,
organizational development
consultant

else, leadership courses like Carnegie Mellon's are an excellent way to help weed out those managers who discover during the training that they would rather spend their time developing products and making money than developing and molding employees into a team. **CIO**

Can leadership be learned? Can leaders be trained? Let us know at hotseat@cio.com. Polly Schneider Traylor (polly@traylor.us.com) is a freelance writer in Boulder, Colo., specializing in business, technology and health care.

Leadership Agenda BY SUSAN H. CRAMM

A Letter to CXOs

You have the IT capability you deserve



Usually I address CIOs in this column, but this time I draw on my experiences as a CIO, CFO and executive vice president to address CXOs.

I believe that every organization has the IT capability it deserves. If it's great, that means the CXOs have IT on their radar screen. If the capability is poor, blame everybody—starting with the CEO. I have heard many executives grumble about IT. The funny thing is that many of the problems are self-inflicted. Often there is a boom-and-bust approach to "fixing" IT, characterized by a period of overinvesting followed by a period of underinvesting. That bipolar approach to IT management delays the development of disciplined IT management practices and the steady delivery of IT capability and value.

See if this sounds familiar. Some cranky general managers (perhaps you're among them) start grumbling about the lack of IT delivery. Others jump on board and determine that the current CIO is genetically flawed and must be replaced. After a lengthy search and hefty retainer, the new CIO comes in—a talented, experienced IT executive with a mandate for change. Big expectations are backed up with big budgets, and a bunch of big development initiatives are launched. A few years later, expectations collide with the realities. Delivery is behind schedule, projects are over budget, and the cumulative support costs associated with these initiatives start mounting.

Again, the cranky general managers start grumbling, this time about the high cost of IT relative to value realized. Others jump on board, the IT budgets are cut back, the CIO leaves (to join another company facing the start of its boom cycle), and a "custodial" CIO is hired to oversee the bust cycle, characterized by cost cutting and strict controls. Again, after a few years, some cranky general managers start grumbling about poor IT delivery, and the cycle continues.

This cycle of underinvesting and overinvesting is classic, but not transparent to most because it requires a 10-year perspective—typically longer than average executive tenure. If you are starting to hear yourself and other CXOs grumbling in the hallways, you have an opportunity to redirect this energy to introduce a more disciplined approach to IT management. Disciplined IT management is characterized by a focused IT agenda, steady IT investments, value accountability and monitoring, short-cycle delivery and strong IT leadership—from within and beyond the IT department. You can help break the IT boom-and-bust cycle by doing the following.

STOP THE BLEEDING. Halt projects that are clearly in trouble, and don't approve new projects, additional spending or more staff. You won't have the information yet that you need to make changes, but you can make sure things don't get worse.

REDEFINE ACCOUNTABILITIES. Understand that everybody is on the hook for fixing the problem. The era of the IT valet is over—business executives can no

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longer drop off their IT wish, go do their "real job" and then expect the solution to be waiting at the curb when they are ready

for it. CIOs are not accountable for realizing value because they don't own the three Ps: the business P&L, people and processes. General managers are responsible for the what of IT, while IT managers are responsible for the how.

Your tasks include figuring out where IT should be invested, outlining the investment justification, managing the change program, redesigning the business processes and upgrading the skills of the frontline performers. The CIO's responsibility includes defining and facilitating the IT governance process, delivering projects on time and on budget, provisioning basic services (such as help desk, operations and networking), and monitoring performance. CIOs must also define standards and processes around project management and methods, human resources, security, architecture and procurement.

CHART THE FUTURE. Partner with the CIO and define an IT-enabled business strategy that identifies what IT initiatives are required to support the business strategy. Make sure that only initiatives with value commitments from the general managers make it through the strategy. Give your CIO some time to work up the implementation options (the how of IT) and the organization requirements (the who).

BALANCE SUPPLY AND DEMAND. The steady hand of IT management requires that the CFO determines how much the enterprise can afford to invest in new IT projects and on an ongoing basis. Level funding for IT initiatives makes sense because, barring dramatic structural shifts (due to startups, mergers and acquisitions,

and so forth), a company's financial and human resources capacity doesn't change much year to year. There is only so much money and so many people to go around, and once ongoing operations are funded and staffed, there is usually very little left to allocate to business-building opportunities.

FOCUS THE I.T. AGENDA. The benefits of a focused agenda are clear. Focused organizations work on fewer things at one time but get more done over time. Focused organizations realize value sooner because they understand Pareto's Law and target 80 percent of the benefits with 20 percent of the effort. Focused organizations are able to react quicker and make fewer mistakes because they have more

in place, focus your IT tactical plans on low-risk initiatives. Make sure that the leaders you bring in demonstrate an understanding of the principles outlined in this article.

MANAGE RISKS. There is one key principle here: Big projects violate organizational physics. They are too risky for three reasons. First, competitive industry conditions and basic human nature limit organizational attention spans to about six to 12 months—far less than the duration of big projects. Second, most massive initiatives are an educated guess about what will move the business, with only a foggy clue about "requirements." Finally, mere mortal project managers cannot bring projects involving more

With help from you and other CXOs, the CIO can require that all initiatives deliver value within six months.

senior people overseeing the initiatives. Focused organizations spend time talking about projects rather than talking about project tracking. And focused organizations can hold people accountable for results.

With the level funding and a focused agenda in place, you can develop a multiyear investment and implementation plan that generates the necessary annual return.

STRENGTHEN THE ORGANIZATION. Sometime during the strategy-making process, you have to make a decision about whether you have the right type of technology leadership—in and out of the IT organization. If the current leadership falls short, it's time to initiate changes.

While you're getting the right people

than 50 people over the finish line without significant problems with time, scope or budget.

With help from you and other CXOs, the CIO can require that all initiatives deliver value within six months. There will be exceptions, of course, but they should be held to less than 10 percent of new investment dollars. Short-cycle time can work if you require short-term value commitments and ensure that monitoring metrics are included within the scope of projects. **CIO**

Susan H. Cramm (shcramm@aol.com), a former CIO at Taco Bell and former CFO at the Chevys restaurant chain, is president of Valuedance, an executive coaching firm based in San Clemente, Calif. To ask her questions, go to www.cio.com/leadership/agenda.html.

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World View

Doing Business Globally

John Henry Outperforms Collaborative Technology

A case history of how advanced design technology proved no match for good-old human know-how

BY DAVID DOBRIN

COLLABORATIVE DESIGN is often billed as a transformative technology that can overcome the traditional limitations of doing business globally. That's what my friend, the CIO of a shoe company, thought. But he hadn't yet met a person I call John Henry Hwang.

The original John Henry was a low-wage laborer who worked on railroad tunnels in the South after the Civil War. Those big strong men used pile drivers and hand drills to make holes for dynamite. According to the legend of John Henry, some clever salesperson (some say it was a manager) tried to put him out of a job by bringing in a steam-powered drill. Henry challenged the drill to a race. In the shale of those mountains, a strong man like Henry could, and did, outperform the drill, though Henry died in the attempt.

John Henry Hwang (not his real name) is a modern day Chinese version of the legendary John Henry, who has so far outperformed a stereolithography (STL) machine. Have you ever seen one of these? It can take a virtual 3-D image from a software package such as Catia and put out a colored 3-D model made of plastic. The STL machine divides the 3-D image into thin layers



and makes the model by laser printing layer after layer of plastic.

Slick. And apparently useful at my friend's shoe company. Here's why. Right now, the shoe designers produce hundreds of designs for each season. The designs are sent to China, and the Chinese manufacturer's John Henry Hwang makes a 3-D physical model from a design. Six weeks later, the models come back, the muckety-mucks get together and the final products are chosen.

What if we could just use the STL machine? We could save six weeks and who knows how much modeling cost, my CIO friend thought.

The Challenge

The CIO called a company that leases STL machines, and, serendipitously, it had a 3-D model of a shoe sitting around its office. The CIO got the model—and in one of those rare moments, about which you brag to your spouse—walked into

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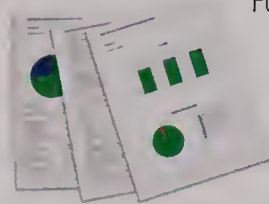


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the president's office and plunked it on his desk.

The president's reaction was the kind you like to come home and brag to your spouse about. If you're thinking, "Wow. That's great. Get on it right away," you've got the gist of it. (The CIO's wife almost certainly got a somewhat longer version.)

When the CIO walked the model around to the various division managers, their reaction was also positive.

To understand what happened next, we have to backtrack a little. Several years ago, the shoe company had bought design software that was built specifically for this kind of apparel. The implementation had run into difficulties, but the CIO was

going to correct any mistakes, fix any proportions, anyway. Using a precision CAD tool—regardless of whether it's 2-D or 3-D—is not only unnecessary, it's extra work for the designers.

Round 2: Rapid Prototype Loses Ground

The CIO wasn't about to throw in the towel yet. Hovering at his back, after all, were the words of his CEO, "Get on it." There were still six weeks to save and the costs of creating the model.

My friend got me involved at that point, and we talked it over with the Catia people. They suggested the following idea. What if you created the design with a 3-D CAD package, then did a conference call with John Henry Hwang? You could each tweak the CAD design to take manufacturability into account, then use STL to create the prototype. A six-week process would drop down to one or two days. There'd be overhead—John Henry Hwang and the designers would need CAD seats—but you'd get a lot more control over the design, and the time to market would be under a week.

This, of course, is exactly why people do collaborative design (and buy design software). But alas, collaborative design isn't coming to my friend's company. He went back to the division with the most fashion cycles and said, "How about it. Two to three days instead of six weeks." (He didn't mention the overhead and the required change in their way of working.) And they said, "Don't bother."

Round 3: Technical Knockout

You see, John Henry Hwang had trumped the machine again. The designers in this area were already unhappy about lead times, and they had asked John Henry Hwang what he could do about it. Now, with the help of airfreight, some creative scheduling, some all-night work by Chinese employees who get paid about what John Henry did 100 years ago, and I don't know what incentives to customs officials, they get models back within a week. And the price of the models has gone down to zero. (It's now buried in the cost of manufacturing.)

Well, we were all taught a lesson. Appropriate technology works best, and sometimes no technology is the most appropriate. My friend's the CIO, and he likes cool things (I too think STL and global collaborative design are cool), and he can see that the business problem could be solved with cool technology. But he didn't need all that cool technology. All he needed was John Henry—Hwang. **CIO**

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John Henry Hwang relieved the designers of any requirement to make their designs precise. Using a precision CAD tool—regardless of whether it's 2-D or 3-D—is not only unnecessary, it's extra work for the designers.

new to the company and figured that a few people were using the package and could give him a 3-D file that could drive the STL machine.

Nope. Nobody used the 3-D package anymore.

OK. What about a 2-D model? AutoCad and its myriad competitors were surely being used on all those Macs over in design. The CIO then contacted Catia to see whether it could take a 2-D image and convert it into a 3-D image that could drive the STL machine. Not a problem. You can feed 2-D images into Catia and get an exact rendering without too much manual tweaking.

Round 1: Flexibility Beats Precision

In the first division the CIO went to, the first designer he found didn't actually use a computer. She would sketch a design and fax the sketch to China. A design engineer at that end would sit down with John Henry Hwang and talk the design through with him.

There's a good reason for this. Not every fanciful whim of every designer can be turned into a real, wearable item. Materials can only be cut to such and such a thickness or sewn in such and such a way. (John Henry Hwang actually makes the prototype using the same machines that create the final product.) Many small adjustments are made as the model is built, and the result is not really a point-to-point replication of the sketch. It's more of a design taken to the second generation, a prototype.

The effect of this is that John Henry Hwang has relieved the designers of any requirement to make their designs precise. He's

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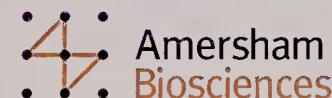
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CIO Contact Information

Editorial, Advertising and Business
Offices: 492 Old Connecticut Path,
P.O. Box 9208, Framingham, MA
01701-9208, 508 872-0080.

CIO (ISSN 0894-9301) is published
semimonthly and as a combined issue
December 15/January 1 by CXO Media
Inc., 492 Old Connecticut Path, P.O.
Box 9208, Framingham, MA 01701-
9208. Periodicals postage paid at
Framingham, MA, and at additional
mailing offices. Canada Publications
Mail Agreement Number 1902075.
CANADIAN POSTMASTER: Please
return undeliverable copy to P.O. Box
1632, Windsor, ON N9A 7C9.

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CIO, 492 Old Connecticut Path, P.O.
Box 9208, Framingham, MA 01701-
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all others the one-year basic rate is
\$94 for the United States and
Canada, \$175 to foreign countries
(payable in U.S. funds only). The
single copy price is \$9. Please allow
four to six weeks for new subscrip-
tions to begin.

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60065-9816. Printed in the U.S.A.

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2 This intrepid dotcom CEO once stayed in a scorpion-infested, \$5-a-night hotel room in Guatemala in order to meet with local craftswomen whose village was being wired so that they could sell their wares online.

3 This software CEO always wears a suit, even in the famously laid-back sartorial culture of Silicon Valley.

4 Which technology company CEO twice has dropped his drawers in the middle of a yacht race to moon another 20/20 honoree?

5 This Internet pioneer built his first computer using an old television set and a soldering iron.

6 What outspoken technology leader scored a perfect 800 on the math half of the SAT?

7 This politically active Silicon Valley icon's name was floated as a possible running mate for Al Gore in the 2000 presidential election.

8 This technology inventor says he programs his brain to ponder problems while he sleeps, a technique that has led to the development of a virtual reality process for which he is now pursuing a patent.

9 Which CIO for a global delivery service is a former Air Force brat whose worldview comes from having lived abroad almost exclusively until the age of 15?

10 This CEO was named *Time*'s Person of the Year in 1999 although his company went eight years without recording a profitable quarter.

11 Which entertainment company CIO played in a rock band with the immortal Gary ("I danced 'til a quarter-to-three") U.S. Bonds?

12 This technology leader is an expert in both the Hebrew Bible and Egyptian hieroglyphics.

13 This Silicon Valley titan has created a medical research foundation to study the causes and effects of aging.

14 This insurance industry CIO once introduced herself to her employees by showing them slides of the Good Witch of the North and the Wicked Witch of the West.

15 And speaking of show biz, this technology president and COO is the proud recipient of both an Oscar and an Emmy.

16 This financial company COO married psychology with data mining to lead his company to the head of the customer service pack.

17 Which travel company CEO is such a contrarian that he is (seemingly) undercutting his own business by promoting video-conferencing technology?

18 This Internet visionary is currently helping NASA build an interplanetary version of the Internet.

19 Which chemical company CIO has appeared at company functions as Elwood Blues, Dan Aykroyd's half of the Blues Brothers?

20 This CIO has been awarded the French Legion d'Honneur Award, an honor that was instituted by Napoleon and is the equivalent of a British knighthood.

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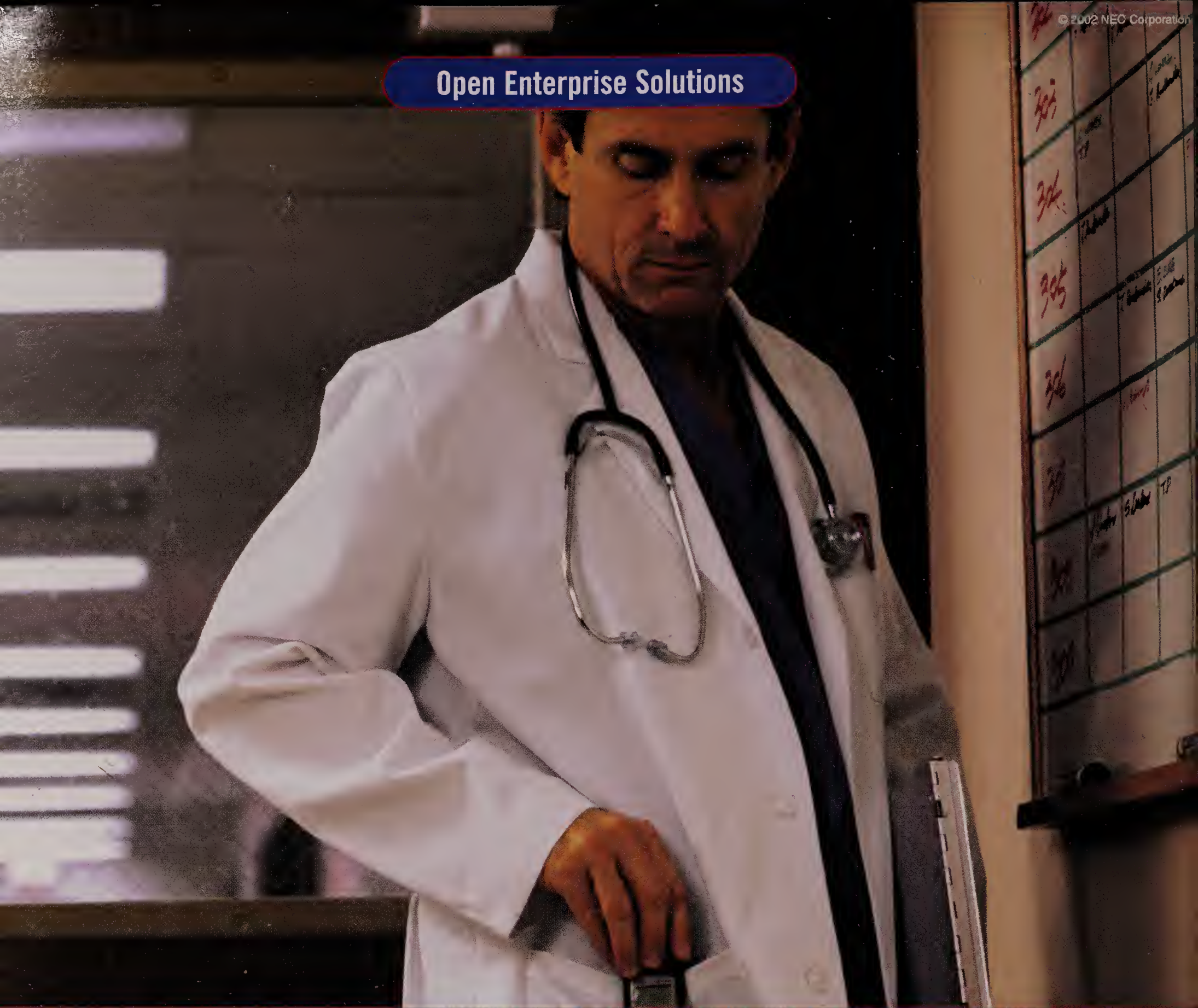
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